

THE IRON AGE

THURSDAY, JUNE 5, 1890.

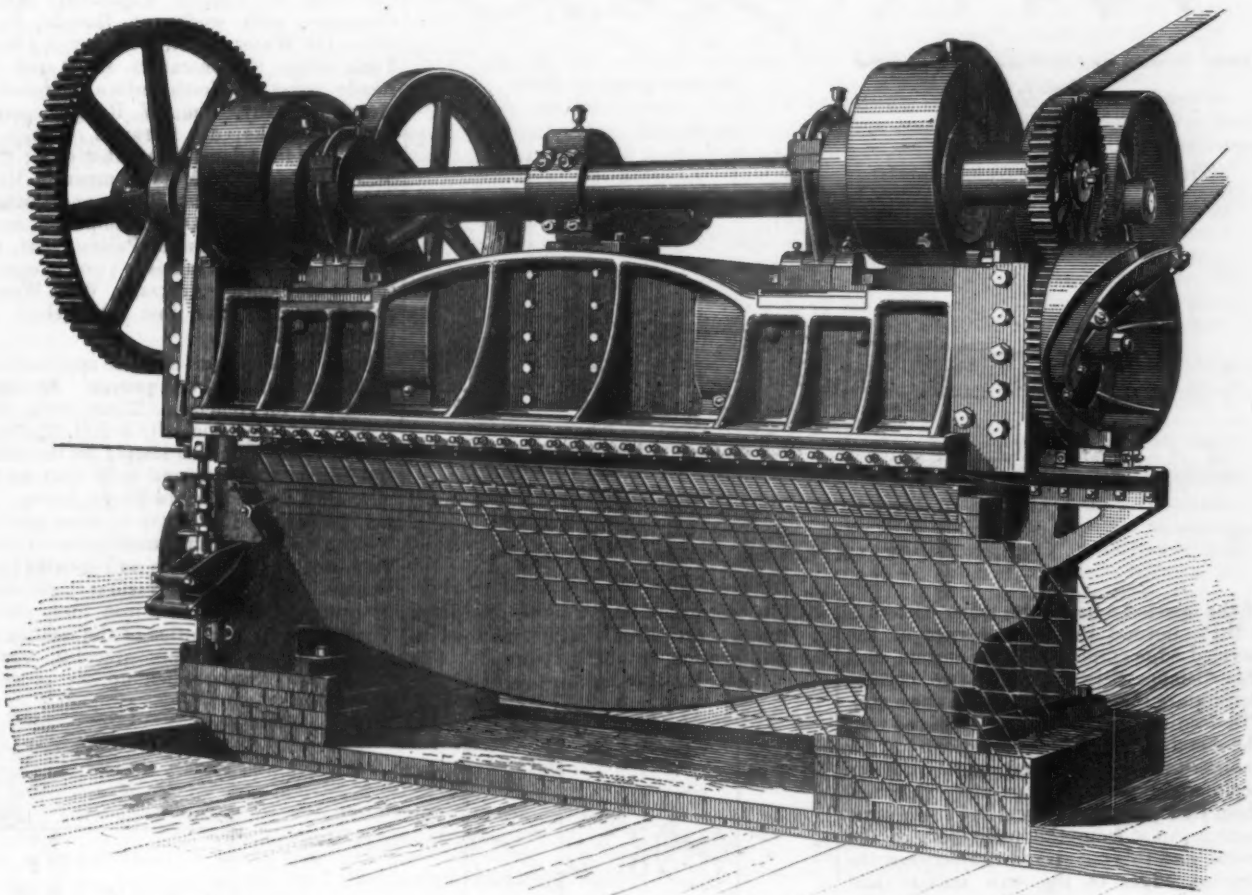
Expanded Metal Machine.

The massive machine herewith illustrated is one of the many special appliances, and its product constitutes one of the late interesting developments of this "Age of Steel" now looming up so grandly. Both machine and product are unique. In operation a comparatively narrow plate or band of steel is passed in horizontally at the left, as if to be slit. Instead, it is slashed or cut in a peculiar manner, and as fast as cut these slashes are extended or distended downward, each series of slashes forming a series of diamond meshing as shown. Thus, a web or fabric of meshes

by any ordinary consecutive system would be distorted by that to follow, or to distend or to separate the edges of a plate which normally is 7 inches apart to a distance of 4 feet, without destructive action on the material or causing general wreckage, would involve more than the best steel "good nature" could bear. Suffice it to say, then, that in each jaw are carried an equal number of peculiarly formed oblique knives—arranged as to their faces or cutting edges—in a stepped manner. The whole series of each forming zig zag faced continuous knives above and below. These are carefully made and adjusted. The upper jaw has the general make up of the same part in an ordinary

comes a seeming anomaly. While ability to roll up the fabric, as made and cut to lengths as needed would seem desirable, the makers say the very ability to permit this would prove its incapacity for the useful purposes mentioned hereafter. It is stiff and rigid, while tough and of a character peculiarly its own and distinct from the usual twisted or woven wire fabrics, and possessed of totally different capabilities.

On the main shaft of the machine are placed three eccentrics, two being at the ends and one near the center. This shaft is actuated from the driving shaft by a pinion and gear, as shown at the left. The end eccentrics operate the upper bar which



EXPANDED METAL MACHINE.

is made, whose general plane is at right angles, transversely considered, to that of the original plate. The slashing is exactly similar to, and the fabric not unlike the "fly trap" work of children. Instead of paper, soft, tough steel is the material treated, and for the scissors a huge machine of eighteen tons, on an equally massive foundation, is the instrument. The name given this metallic fabric, if we may so call it, is "Expanded Metal," and the coining of the term is justified when we state that the machine shown will produce from a plate 9 feet long by 7 inches wide a web 8 feet long and 4 feet wide. It is difficult, without elaborate illustration, to elucidate the action of this machine, but this short, general statement may be made, premising that it will be evident to any one that alternate or staggered slashings of the metal at close parallel intervals would give the scheme of the operation. A moment's reflection, however, would suggest that the part cut and opened out

guillotine shears, but the lower, or what would be the stationary knife, has a certain amount of oblique lateral movement as the upper and cutting jaw descends. The plate is fed in automatically and somewhat obliquely to general line of knives, the upper jaw descends and from a corner of the plate a diamond or partial one is cut and formed. The plate advancing again, another stroke is made and a pair possibly produced, to be followed by more cutting, more building of the web, each stroke forming a new row of meshes, and as plate after plate is added at the left of machine this building goes on. Indeed, given a continuous band or strip the fabric would be equally continuous, like the paper product of a pulp mill; but practical and commercial expediency place limitations of size at 4 feet as the maximum width, and 8 feet for the usual length of a finished sheet, although this length frequently is exceeded by a foot or two in special cases. And here

carries the upper series of cutters and is reciprocated vertically. The lower bar, holding the lower cutters, is so guided that its cutters move parallel to the upper cutters. The form of the cutters is clearly shown in the drawings. They are held by a screw passing through a slot which permits of their being adjusted, and are arranged to overlap each other.

As the outer eccentrics on the main shaft are revolved the upper bar is raised and lowered, thereby working the cutters secured to it up and down in a vertical plane and over the cutters in the lower bar. As the upper cutters descend, their bevel edge moves along the bevel edge of the lower cutters and the lower bar, being free to move longitudinally in its bearings, is moved horizontally, and when the upper cutters have finished their downward movement the two sets of cutters are in the positions shown in the drawings. The sheet of metal is fed between the two sets of knives by which it is cut and bent to

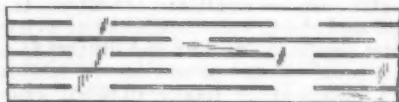
form the mesh. The uncut intervals in the sheet form the union of the meshes. This uncut interval is formed as follows: The lower bar is moved a certain distance. This distance is such that the upper corner

hours' running, which, if made of maximum width of 4 feet, would give 16,000 square feet. This is the largest mesh made. Other and varying sizes down to $1\frac{1}{4}$ inch each demand a separate machine,

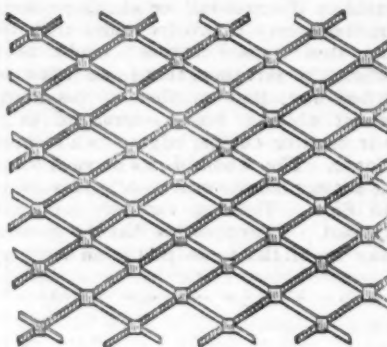
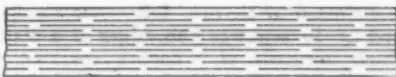
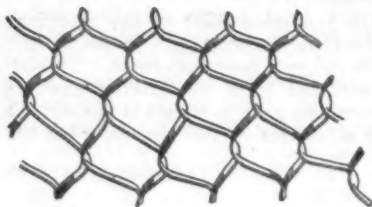
sheets are then treated in a good dipping paint of the color desired, and thus doubly coated, on drying are ready for market. The peculiar flatness of the sheets, the strand edges "spooning" into each other nicely, permits comparatively easy packing and preparation for transportation.

Before enumerating some of its general and many uses, and with saying new applications are being found every day, it will not be amiss to give some brief historical account of this invention. The inventor is John F. Golding, long and favorably known to the metal fraternity as the late business manager of our contemporary, the *Industrial World*, of Chicago. The patents are held by a corporation, of which Oscar Bradford, of Curtis & Co. (St. Louis and Chicago), is president. Licensees for various and respective territories are: Chess, Cook & Co., well-known manufacturers of nails, tacks, soft steel plates, &c., who are carrying on this department of their business under the style of Central Expanded Metal Company, with works at Rankin, Pa., office 116 Water street, Pittsburgh (New York office 85 Chambers street and 87 Reade street); Northwestern Expanded Metal Company, Wm. W. Ramsey, president; Works at Hermosa, Chicago office at 148 Adams street that city; the St. Louis Expanded Metal Company; Merrill Watson, president, Biddle and Collins streets, St. Louis. Other companies are: one in Canada; one on the Pacific Coast, to be located at San Francisco; one in operation at Melbourne, Australia, Wm. Ward, president, and one just established in Great Britain.

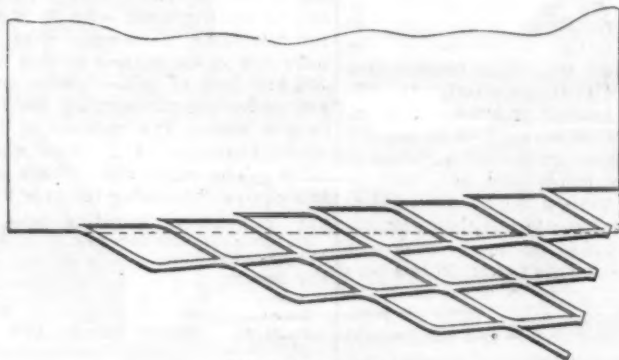
Some brief account of these applications would seem natural and proper. Its largest use is for fencing. These webs described, of 8 feet long by 3 feet, $3\frac{1}{4}$ feet, or 4 feet, are mounted simply on the same framing as to posts and rails that go to make up a paling or ordinary fence. It may be mounted in better style on special wood rails, which the manufacturers provide, or for better lawn and garden enclosure it is carried on various light and graceful mountings of iron and steel. Without extended notice of the facility of its erection, its pleasing, graceful, unobtrusive appearance when up, we proceed



Sheet Slashed and Stretched to Form the Meshes.



Another Form of Mesh.



Sheet Partly Cut.

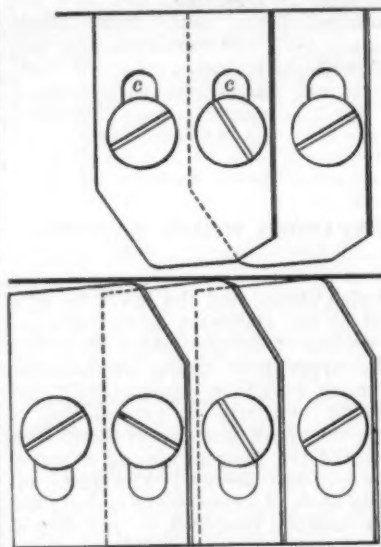
SPECIMENS OF EXPANDED METAL.

of the beveled edge of the lower cutters is a little beyond the lower corner of the beveled-edge corner on upper cutters, and this distance between these two corners determines the uncut interval in the metal. The feeding movement is so adjusted that the metal is fed at each movement just far enough to form the strand, and as the upper cutters descend they push ahead of them that part of the metal and at the same instant cut it from the main part of the metal, and this cut strand lies between the beveled edges of the two cutters and against the lower edges of the upper cutters. The entire piece of metal is consumed and no part or portion is lost or wasted.

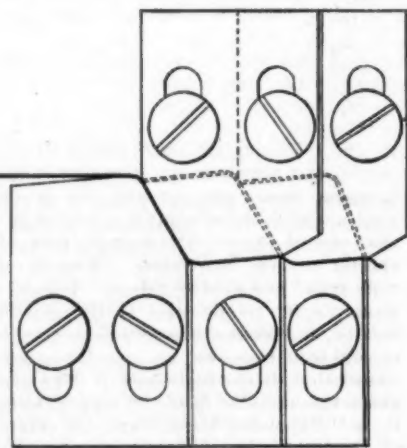
The metal is fed at an angle with the line of the cutters and parallel with the face of each cutter. The reason for feeding the metal at an angle is first, that the cutting bars may be in line with the main shaft, and second, that the metal may encounter the cutters first on one corner and in a line parallel with the surface of each cutter. The object in beginning to cut at one corner of the metal is that each cut, strand, or loop, will be set free by a cut immediately back of it, this cut or cuts always supplying as much length of strand as the preceding knives consume, as the pressing the strands downward and forming the mesh causes the cut and spread part of the metal to assume a form shorter than the uncut part.

The illustration is made after a photograph of a machine now producing fencing web at the works of the Pittsburgh Company. The diamonds in the mesh seen emerging from machine measure 7 x $3\frac{1}{4}$ inches on diagonals. This machine produces regularly some 4000 feet linear in 10

with its corresponding knives, except as in lathing, the stroke adjustment gives the modification in mesh required. The plates entering the machine are treated



Cutters in Position to Receive Metal.



Cutters in Position After Having Cut and Expanded the Metal.

KNIVES USED IN EXPANDED METAL MACHINE.

automatically to a lubricating compound, the largest portion of which is the best boiled linseed oil. This, after serving its purpose at the cutting, in a few hours becomes an unimpeachable paint. The

to say that in the matter of strength, fitness, &c., for fencing, this material has an endorsement in Chicago of great importance. Our readers will remember that quite recently in these columns we dis-

cussed at some length the surface steam railroad problem in that city. In line with effort for greater provision for safety, and to have some mitigation of the stringent city ordinances there in force as to speed of trains, the companies are fencing up their tracks and providing safety gates at crossings. Casting about for means to do this efficiently and cheaply (since so many miles were involved and clumsy wood fencing seemed out of the question generally) an ultimate physical test was made of the strength of an expanded metal sheet ordinarily provided, by one of the most important railroad companies there. A sheet fastened horizontally and fastened only at ends to a frame, was loaded gradually until at 2700 lbs., attachments and frame gave way leaving the intermeshing intact. This was so conclusive and convincing that an order was at once placed for some miles, which is now being executed for them, as well as some miles for each of three or four other companies, in all an aggregate of 17 miles, with many more in prospect. Generally these railroad fences are 7 feet (two sheets high), stapled on wood framings. Many applications are made of the larger sized mesh to stable and elevator guards safety gates and screens. Being self framed it is readily treated by the most ordinary mechanic without the use of iron workers' tools. For farm drive gates simple sheets stapled on wood framing give a light, neat, strong and satisfactory result. Such gates are also mounted by the manufacturers in steel and iron frames, but the above is one instance of "home made" work. Standard all-metal foot gates are made and sold separately. The great strength of this material, self tied and solid, as to intersections, has suggested its use as a net work binding to be imbedded in artificial stone pavements. The same as an imbedded binding in thin monolithic beton facings for levee construction has been proposed recently. Smaller sizes of mesh are used for window screens, lawn, garden, poultry and aviary work, tree guards, &c.

It is a fact that wire workers exist only in large cities; the need for window screens, guards, &c., is relatively as great in the smaller places. Sheets of expanded metal may be carried in stock by general hardware dealers and of various sizes, so that for local demand with tinners' snip shears, guards, &c., may be cut out and the framing, mounting, &c., done at home by an ordinary carpenter. Sheets of the finer mesh rolled into cylindrical forms, mounted with light self-hooking bands, and with the neat iron stakes provided, the whole painted, make tree guards impervious to the depredation of animals and that of the "bad boy," and are easily erected by any one. The spiral lines produced are graceful and pleasing, the structure is unobtrusive, does not conceal the trunk form, and at a little distance is invisible.

But one of the most important forms of expanded metal is lathing. Steel of 22 gauge is cut and opened out for this, and the sheets are uniformly two lath, 8 feet, long by 18 inches wide, and of the form of mesh shown in cut.

This is readily applied, as it needs no stretching, and like wire lathing and unlike perforated sheet lathing is "all key." Self contained and solid, it cuts without waste, needs no furring, since it cannot be stapled so close, from its peculiar rake of surface, as to not give key on any extended flat surface. It readily may be molded like so much sheet lead and this form it retains. This has made it quite favorite for hollow and curved work, such as is found in churches, opera houses, &c. Arching gives added strength and stiffness, and is a unique and singular function. It goes without saying, plaster carried on this foundation is fire resisting in a high degree. Experiments have demon-

strated that under the severest stress of firing this metal foundation remains neutral and does not strip its coating. Conversely the severest cold does not cause destructive contraction on exterior cement or plaster work, as in gables.

A new departure in wood building is another outgrowth of this material promised. Several wood studding houses have been constructed, whose whole exterior walls have been of cement carried on a sheathing of expanded metal. It is expected that many buildings will be executed in this manner this season, the most important in prospect being the Ames office building, Helena, Mont., 125 x 90, of six stories, whose whole interior will be done on expanded metal lathing, while its exterior is to be finished in cement done on the same. The president of the Australian Expanded Metal Company, Wm. Ward, just passing through Pittsburgh on his way to England, states that a handsome terraced block of residences at Melbourne is now under execution, all done in this same manner. The perfection and beauty of cement finished structures in Europe, especially in Germany, no traveler will gainsay. Examples here in America are generally doleful failures, from improper foundation for the plastic material, and shortcomings in the latter, not worthy our position otherwise in the world's structural art. This constructive method lends itself peculiarly to the massive Richardsonian treatment now so much in vogue. It is needless to say the fire resisting, slow combustion qualities of such structures, inside and out, will be rated well up toward A1 by fire underwriters, and the comfort of their inmates against vicissitudes of heat, cold and humidity will be that gotten from a possibly combined house of stone or brick and wood. Structurally, walls on such self-braced lathing, inside and out, would be of great strength and could be sustained on lightest foundations on otherwise doubtful locations. In conclusion, it is claimed by its advocates that this system will not only be in the line of good and economical construction, but safe, substantial and enduring.

Basic Iron.

The South Tredegar Iron Company, of Chattanooga, Tenn., made some basic iron during 1889, and have furnished the *Bulletin* with the following information as to how it was made: Basic iron is iron which has been desiliconized in a Bessemer converter, and dephosphorized on a second lining in a Danks or other form of furnace, on the lines of the inventions and discoveries of Dr. L. D. Chapin, of Chicago, Ill. worked out to their logical solution. We take the high phosphoric pig iron of the South, high also in silicon, melt it in a cupola, thence pass it through the converter, with a shorter blow than for Bessemer steel, and thence run it into gas heated puddling furnaces, where it is "balled," and is then ready to be squeezed or hammered. We prefer the hammer. We are able without difficulty to handle charges inside of an hour from cupola to muck bar, removing as much of the silicon and carbon as we care to, and also removing over 97 per cent. of the phosphorus, and at a most reasonable cost. You will at once see that this settles the steel business from Southern pig iron, as we can readily and cheaply deliver strictly neutral blooms or muck bar to the steel makers in any desired quantities. We are the only parties having any sub-license so far, but we understand that the holder of the license for some 25 States, John F. Haskins, M. E., now of Chattanooga, Tenn., is negotiating with others for its adoption. We are only fairly started with the process, but see no reason to regret having taken it up.

NEW ENGLAND NOTES.

The annual report of the New England Telephone and Telegraph Company contains the following:

	1889.	Increase.
Gross earnings.....	\$1,355,570	\$128,263
Expenses.....	957,305	100,724
Net earnings.....	298,265	27,538

Of the total amount charged to new construction—\$318,169.17—\$190,000 has been expended for underground work, and \$88,000 for extension of extra-territorial and toll lines. Total conduit constructed in 1889, 27,978 feet containing 239,334 feet of duct. The underground system in Boston now consists of 73,752 feet of conduit, the total length of duct being 733,949 feet, or about 139 miles, with a capacity of about 16,000 miles of single conductor. The total length of new cable, of all classes, placed in use in the Boston Exchange during 1889 is 124,405 feet, the length of underground wire reported in use at the close of the year was 3599 miles, or about two-thirds of the entire amount employed in opening the Exchange. In the use of this system, the Boston Exchange now stands second among all the exchanges in the country, New York being the only city in which a greater mileage of underground wire is in operation for telephone purposes. The company have now in use in their various exchanges 446,470 feet of cable, aerial, submarine and underground, carrying 6600 miles of copper wire. The mileage of Exchange wires December 31, 1889, was 19,784 miles. The expenditure upon the plant and equipment during the year has been:

For construction, including bells and long distance desk sets.....	\$331,191.94
For reconstruction.....	106,956.52
For repairs.....	216,289.55

Total.....\$654,438.01
As against an expenditure for 1888 of.....460,157.82

A Portland, Maine, syndicate has made a big offer for the control of the patent on the new locomotive now in process of construction at the Portland Company's works, so far as New England is concerned.

The Atlantic Works, at East Boston, are building radial steel trucks for the Robinson Radial Car Truck Company, and the Bemis Car Box Company, of Springfield, are building 14 trucks of the same description, to be used on the West End Railway, of Boston, under open cars which are now being constructed.

The rumor that the Underhill Edge Tool Company, at Nashua, renamed the American Axe and Tool Company, had been sold to the Boston and Maine Railroad is pronounced false. It grew from the fact that the syndicate which has purchased the property in that vicinity has had to survey all the property in order to establish their boundary lines.

Efforts are being made by the Springfield, Mass., Board of Trade to induce the Spencer Gun Company, of Windsor, Conn., to locate in Springfield. The gun company have been obliged to give up their quarters in the building of the Eddy Electric Company, at Windsor, owing to the latter concern's increase of business. Windsor Locks people have offered inducements, but the company prefer to look elsewhere, as they require greatly increased facilities.

A syndicate headed by Siemens and Mannesmann have bought the works of the English Landore Steel Company, in order to manufacture Mannesmann tubes on a large scale.

One of the large cast iron pipe manufacturers in the country estimated recently, in conversation with a representative of *The Iron Age*, that the annual production of cast iron pipe is close to 500,000 tons.

Ammonia Pump.

The illustrations show a side and end view of a new ammonia pump manufactured by Dean Brothers Steam Pump Works, Indianapolis, Ind. The pumps are designed to work against a pressure of 100 to 250 pounds per square inch in connection with absorption ice machines. The valves and piston rods are made of the best tool steel. The stuffing box of the ammonia pump is double with a "lantern iron," the center of which is connected with the suction of pump in such a way as to carry the ammonia back to pump that otherwise might leak out of the stuffing box.

The fly-wheel is very heavy so that the pump can be run at a very slow speed. The yoke for crank has a bearing in the bottom of the frame. All oil drippings are collected in the frame and can be drawn off through the faucet. The parts of pump are all accessible, the workmanship first-class and parts strong. The ammonia cylinder is cast in one piece, so there is but little danger of leakage.

EASTERN MISCELLANY.

It is reported that an extensive addition is soon to be built to the foundry department at the Knowles Pump Works, Warren, Mass.

It is now probable that the Spencer Gun Works, of Windsor, Conn., will locate at Indian Orchard, Mass., instead of at Windsor Locks, Conn., because the manufacturers and capitalists of the latter place will not put \$20,000 in the concern.

The Newton, Mass., Water Board has given the contract for the 5,000,000 gallon pumping engine and boilers for the high service for \$35,000, to the George F. Blake Mfg. Company.

Directors of the Pratt & Cody Machine Company have decided to recommend an increase of the capital stock from \$100,000 to \$150,000, the additional stock to be offered to the present stockholders at par. The additional capital, if the plan is approved by the stockholders, will be used in the erection and equipment of a new building which will adjoin the company's works.

The new addition that Matthews & Hickock, of Burlington, Vt., are building on the north side of their mill is 90 x 40 feet, and will contain a new engine and boiler rooms covered outside and in with corrugated iron. A new Watertown engine, of 100 horse-power, will be put in.

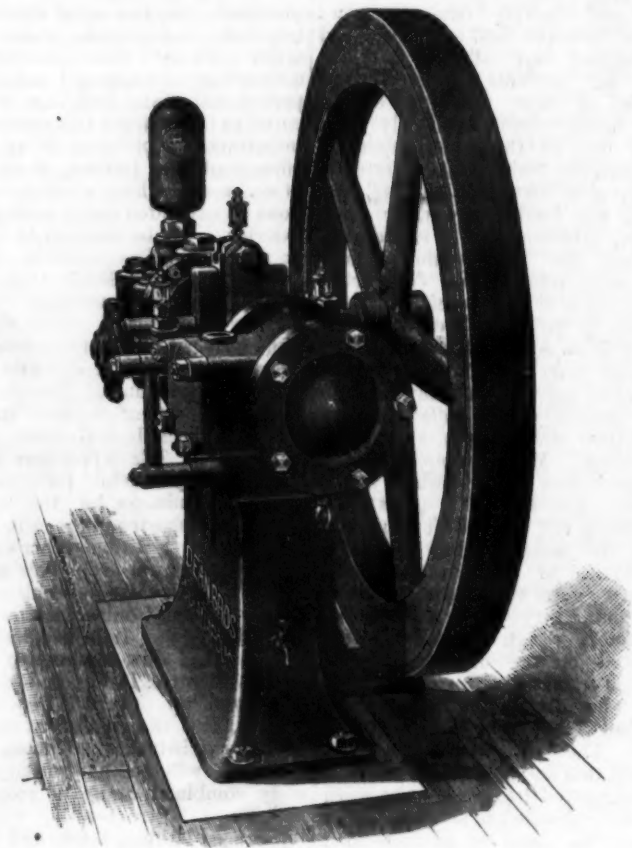
In a suit brought in Massachusetts to compel the American Express Company to deliver certain freight, it was decided that it was no more beholden to do so than the post office. It receives the goods, and those who want them must call for them. If it delivers goods by wagons it is simply to accommodate.

The Spencer Gas Company are successfully running their new departure in the manufacture of illuminating gas. No coal gas is made whatever. Lima oil, a crude oil that cannot be refined and has heretofore been used for fuel only, is used. The process is more economical than the old one.

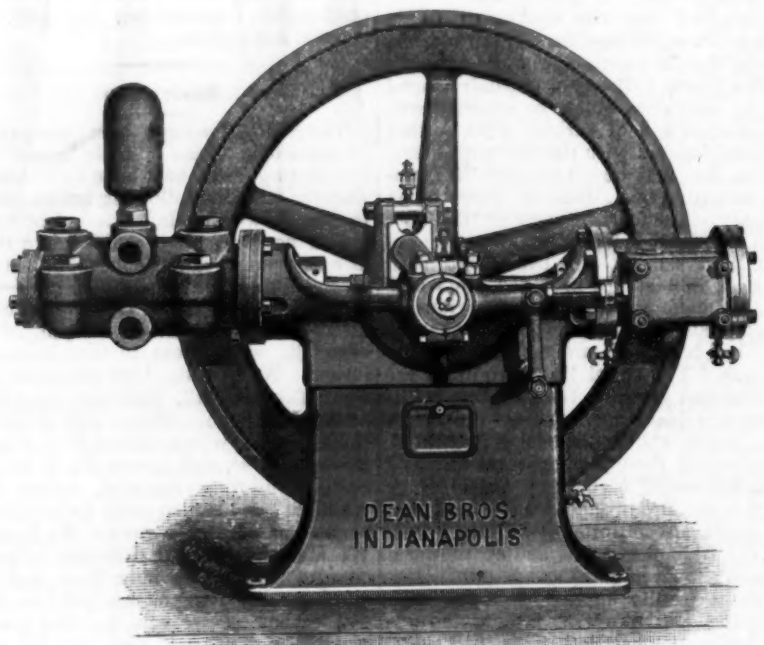
A big land purchase has just been made at Newburyport, Mass., by the Newburyport and Amesbury Street Railway Company, and a power plant is to be established for running the electric lines of the company. The erection of a brick building 100 x 70 feet is to be commenced at once. It will be equipped with a new engine and two large dynamos. The purchase includes 25 acres of land, and on the space not used for power house will be erected machine, paint and repair shops. This improvement will necessitate the expenditure of about \$100,000.

The new central power station of the West End Street Railway Company will consist of a power house and boiler room. The former will be 319 x 173 feet, built of brick and granite. In this building will be 13 triple expansion engines of 1000 horse-power each and a 300 horse power

tracting considerable attention. The boiler has a downward draught instead of upward. It consumes all the smoke, gas and cinders in the combination chamber just below the grate. Several large offers have been made for the patent, a local company desiring to control it for New



End View.



Side View.

AMMONIA PUMP.

compound engine. The boiler house will be 163 x 84 feet, and will contain 24 boilers rated at 500 horse-power each and set in batteries of two boilers each.

The new patent boiler and locomotive now being built at the Portland Boiler Company's works, at Portland, Me., is at

England. It is understood that one of these boilers will be recommended for the new Government cruisers now building at Bath.

A new routing and milling machine is soon to be put on the market by a Boston company which bids fair to have an imme-

diate and large demand. This machine is adapted for the lightest kind of milling as well as the heaviest, the range of usefulness being greater than any other machine now on the market. The special features of the machine make it of great value to the machinist, as a greater variety of work can be done than on the ordinary machine, which is adapted, in most instances, to heavy work only. It is manufactured by the John Becker Mfg. Company, 157 Pearl street, Boston.

Professor Elihu Thomson has patented a device to furnish power for electrical railways at long distance and saving copper wire. At present, if the pressure is 500 volts, say at the power station, it will reach a much less potential on a long run. The present device is to run smaller wires from the power station independent of the trolley wires attached to dynamos of a much higher voltage. When the current reaches the point where it is needed it is taken by a motor generator, which takes it, say at 1000 volts, and turns it into a pressure of 500 volts. Professor Thomson patented a safety conductor for induction systems of distribution. This is for the purpose of "grounding the secondary," and consists of a wire running from the point where an incandescent light or other wire enters a building to a point near the ground where it ends in a canvas conducting surface. From the ground runs another wire to the same point and ended like it. These two conducting surfaces are separated by an insulating film—in practice by a piece of oiled paper—which is impenetrable by a potential of 50 volts, that common in lighting buildings, but which in case of lightning striking the building the wire would be at once penetrated and the bolt carried into the ground, thus making the house safer when wired, as the wire would be a much better medium for grounding the electric current than the body of a person who accidentally made a circuit by touching the wire and a metallic article.

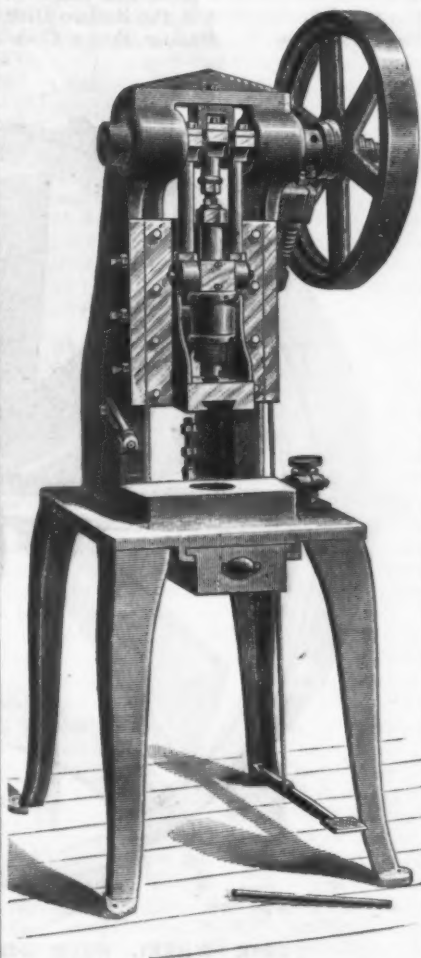
The professor has also recently patented an invention which applies the principles of electric welding to soldering and cementing. By it, after the parts are put together and properly shielded, the electric current is applied, and under pressure the parts are fused together, the heat being applied just where it is wanted. A good deal of time is being put into the work of perfecting overhead details of electric cars at the Thomson-Houston Electric factories, at Lynn, Mass. Professor Thomson has patented a copper trolley guard, so arranged that when the trolley is thrown off by a frog the guard will run along the trolley wire conveying the current to the incandescents in the car until it is replaced.

New England machine shops turning out textile machinery continue to have plenty of business. Several large cotton mills that have been recently reported as soon to be erected in the South will call for a large amount of machinery, and already their agents have arrived in New England to negotiate for such. The numerous instances of woolen mills being started up in New England or plans for new plants will keep builders of woolen machinery actively engaged for some time. The export of weaving machinery of American make is getting to be quite an item, and from what is reported in English papers the machines are giving great satisfaction.

The Pittsburgh Reduction Company, at Pittsburgh, manufacturers of aluminum, are just completing the additions to their plant. The new machinery includes a battery of Babcock & Wilcox boilers, two large Westinghouse compound engines, two very large dynamos and eight reducing tanks. It will increase their capacity sixfold.

Double Acting Crank Power Press.

The accompanying cut shows a new double acting crank power press, recently put on the market by the Stiles & Parker Press Company, of Middletown, Conn., and 207 Centre street, New York. The most noticeable feature in this press is its long slide bearing surfaces which are very carefully fitted. The outer slide carries the cutting or blanking punch, while the inner one carries what is called the drawing punch. Both the inner and outer slide are adjusted with a single screw each. The adjustment of the outer slide is very ingenious, doing away with the usual double screw pitmans which have been used for years in this class of presses.



Double Acting Crank Power Press.

While this press has the double pitmans for its cutting slide it has only one center screw adjustment, which the cut very clearly shows. Through this center adjusting screw passes the inner or drawing slide which again has its own adjustments, thereby making each slide independent in its adjusting parts, a very important feature in this class of tools. The machine is fitted with a new automatic stop motion which can be easily worked at a speed of 250 revolutions per minute. The shaft has a special take up for wear which can also be used as a brake to prevent its throwing over the centers. The frame is designed with special care for the work it is intended to do. It has improved attachments for carrying scrap cutters, pull-offs and gauges, as well as a convenient drawer for catching the work which is made. This press is intended for such work as button shells of every variety, such as collar and sleeve buttons, typewriter buttons, all kinds of metal buttons, round or flat, or any small articles of about two inches diameter and one-quarter inch edge

that are made of thin metal. There are now many of these machines in use and the demand for them is increasing.

VIRGINIA IRON NOTES.

The West Lynchburg Land Company during the past week have been negotiating with Mr. W. P. Riley, of the Valley Iron Works, of Williamsport, Pa., for the removal of that plant to West Lynchburg. The negotiations terminated favorably, and the contract, it is said, has been agreed upon. The buildings for this enterprise will be erected as soon as the plans and specifications are drawn and accepted. Immediately on the completion of the buildings the necessary machinery for this plant will be shipped from Williamsport and put into place.

Work on the new industrial plants at Basic City goes vigorously forward. The furnace foundation has been made especially substantial, having been put down 8 feet. The foundation for the hardware works that is to be removed from Buffalo, N. Y., is nearly ready for the superstructure. The managers of this enterprise are now in the market for boilers, engines, shafting, pulleys, lathes, drill presses, cupola and other equipments. This concern will employ 500 hands before the end of their first year. The work on the foundation for the car works, necessarily slow by reason of its magnitude, is being pushed with all possible speed. Quite a number of new industries, nearly all of which requiring iron as a raw material, are negotiating for location. During the past week a very fine deposit of manganese ore was discovered on the land of Andrew Newcomb, contiguous to Basic City.

It is now stated that the work of construction will commence at once, at Pulaski City, on the large rolling mill that is to be established in that place by the Philadelphia capitalists, and which will give employment to about 300 men.

At Alexandria there has been incorporated, with a capital stock of \$5,000,000, the Barrow Land Company, which proposes to develop mineral lands, and operate iron plants. C. L. Adkin is to be the president of this new company; B. F. Blye, secretary and treasurer.

A rolling mill is to be erected at Goshen Bridge by a newly organized land and improvement company that have a capital stock of \$600,000.

A new iron town—that is to be—is Cloverdale; the Cloverdale Iron and Land Company have been organized with ample capital, and will develop mineral lands and establish industries. Henry Body is president; J. M. Gambrill, vice-president; W. P. Hough, secretary and treasurer.

A 2-acre site has been donated by the city of Manchester to the Johnson Axle Company, of Richmond, and that company will remove their plant thither. The capacity will be considerably enlarged.

The Eagle Cliff Mining Company, W. C. Bullitt, president, and H. C. Groom, treasurer, have purchased the Huddle Iron Mine, near Ivanhoe Furnace.

The Berryville Land, Mining and Mfg. Company have been organized, with A. Moore, Jr., president; A. W. McDonald, vice-president and manager.

The Bluefield Car Works are having a 100-foot annex built to their main structure.

The capital stock of the Roanoke Iron Company will be increased sufficiently to admit of the construction of a rolling mill.

The American Bridge Company, of Roanoke, are building cast house No. 2 at the Crozer Furnace entirely of iron. It will be remembered that this structure was recently demolished in a wind storm.

The Huntington Boiler Works, at Iron Gate, have gotten most of their machinery

into position, and it will not be long before the plant will be regularly in operation.

Stove works are contemplated at Basic City, Glasgow and Lexington.

The Valley Land and Improvement Company, at Luray, are negotiating with different parties for the establishment there of an iron foundry, agricultural implement works and car shops.

The buildings for the foundry and machine shops of B. F. Gravely, which were removed from Martinsville, are now being constructed at Salem, where they will be permanently located.

Ninety thousand dollars' worth of iron ore properties, at Rye Valley, have been purchased by Northern capitalists, and will be developed.

Quite appropriately, Virginia is every year manufacturing more of the machinery necessary in the manufacture of tobacco. In addition to the several cigarette machines that are contesting for superiority are a number of mechanical devices for the preparation of both plug and smoking tobaccos. Among the more recent inventions in this line is the R. W. Coffee stemming machine, which is to be manufactured by a company at Bedford City, having a capital stock of \$1,000,000, and of which corporate concern J. F. Slaughter, of Lynchburg, is president; S. A. Berry, vice-president; M. P. Burke, secretary and treasurer. Another company is being organized just now in the city of Richmond, for the purpose of manufacturing the Old Dominion log-filler bunch machines. Crutchfield & Capston are the principal promoters of this enterprise.

It is currently reported in railroad circles at Norfolk that the Norfolk and Western Railroad are perfecting plans to build car works and a round house capable of accommodating 24 engines at Lambert's Point, the well-known coaling station, near Norfolk. The further statement has been current some time that this road intended building furnaces and rolling mills in the same locality, and with a view to carry this project into execution had already purchased extensive deposits of Cuban iron ore, which they proposed to mine and bring to Lambert's Point and mix with Virginia ores in the making of a high grade of iron. There is no one that I have been able to meet who can vouch for the thorough accuracy of the statements in circulation, but there are a few facts of which there can be no doubt that are fraught with great significance. It is well known that the Norfolk and Western Company have been persistently buying all of the real estate obtainable between the City of Norfolk and Lambert's Point, all of which land lies beautifully for town building. In no known instance has a less figure than \$1000 been given per acre for their property. Surveyors have plotted the land into streets and blocks, and every indication exists that the company have reason for anticipating a mysterious influx of population. President Kimball has even been quoted as recently saying that within the near future not less than 500,000 people will be living along the Elizabeth River in and near the city of Norfolk. What is still further calculated to create the impression that this railroad, that has done so much for Roanoke and other new iron towns on its line, intends to spring some great project within the near future is the fact that the most prominent capitalists interested in the road, together with its leading officials, recently visited Norfolk and took a painstaking scrutiny of the site of their recent purchases. The Norfolk and Western Company are now engaged in building new and immense piers at Lambert's Point that gives additional color to the surmises indicated in the foregoing.

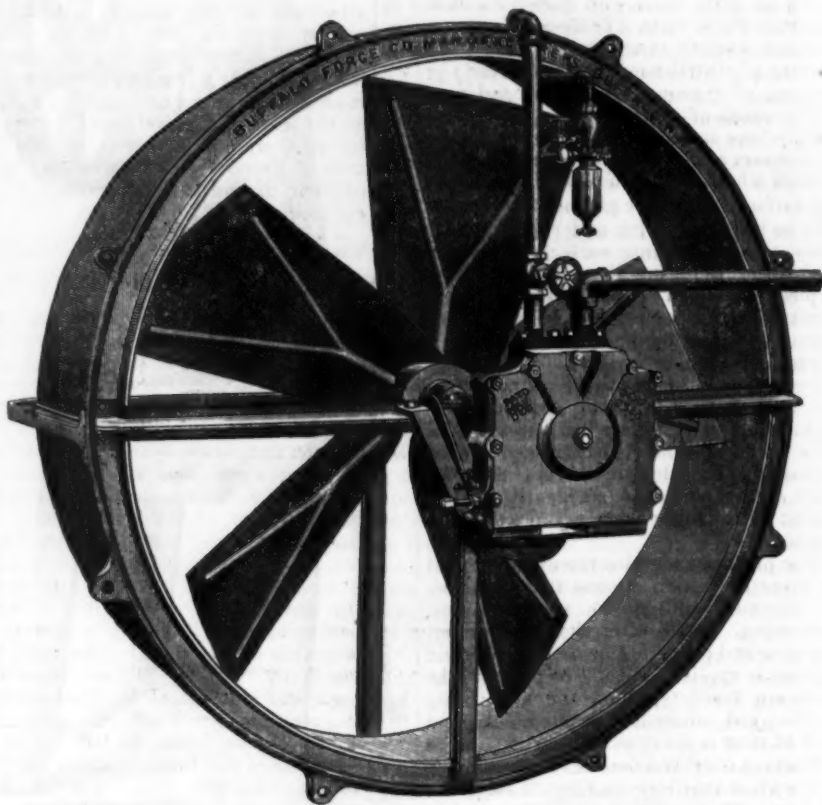
I learn that a rolling mill for the manufacture of merchant bar iron is to be built

at Roanoke in connection with the West End Furnace which is now in process of erection. It is stated that about 100 men are to be employed in the proposed mill, and that the work of constructing the plant is to be commenced at an early date.

Disk Wheels with Direct Attached Engine.

There are numerous places where the best application of a ventilating fan requires the use of a direct attached engine, on account of the impracticability and expense of supplying power by belt connections which often exceed the first cost of an engine, to say nothing of subsequent expense for maintenance. We show herewith the latest design of a direct engine as is now furnished in capacities suited to run the different sizes of the Buffalo Disk Fans, made by the Buffalo Forge Com-

pany through a slot in the back plate of the center piston, the crank pin being secured to a crank disk on the inner end of the main driving shaft. The pistons are held steam tight to the face of the cover by two plates inserted in the back of the outer piston, and acting as slides on the back of the case, which is fitted to receive them. These plates are acted upon by steam let in between them and the back of the outer piston, and are of the right area in each size of engine, so that they hold the pistons back and front, without loss of steam, at the same time. There is no loss of power by friction; the wear of the outer piston is taken up by plates on the under side of which are inclines sliding on corresponding inclines in the bottom of the casing. The wear of the inner piston is provided for by detachable slides at the ends. Coiled steel wire springs pocketed in the ends of the pistons hold the slides firmly to the planed surface of the inside



DISK WHEEL WITH DIRECT ATTACHED ENGINE.

pany, of Buffalo, N. Y. These engines are constructed with special reference for the work, and occupy but little space, though capable of driving the fan at high speed without noticeable vibration or noise. It will be noted their appearance is neat and compact, occupying little more space than is required for belt connections, while they require only a small amount of attention to keep in running order. With using an engine there is no lost motion by slipping or wearing of belts, while the rate of speed may be easily increased or diminished as the work requires, and there is perfect control of the fan as to starting or stopping instantly. This engine, which is double reciprocating with square pistons, will work as well turned up side down and bolted to beams overhead or placed with cover, end down, with the shaft in a perpendicular position, as in the regular way. The engine is within a casing, in which a rectangular piston is held to move backward and forward horizontally. This piston has a chamber in which an inner piston is mounted to slide vertically, the inner piston being mounted in its center on a crank pin, projecting

of the outer piston, in which the inner piston moves up and down. There are only two bearings in the body of the engine, the main journal and crank pin. These are in the form of bushings and are made from the best quality of phosphor bronze, and give no trouble in the way of cutting and heating. From the manner in which the steam is applied to the moving parts, they are less liable to wear than in the ordinary engine.

The Pardee Car and Machine Works, of Watsonstown, Pa., have just completed the construction of 250 box cars, of 50,000 pounds capacity, for the Central Railroad of New Jersey, and are now constructing a number of the newly designed 60,000-pound capacity hopper gondola coal cars for the Beech Creek Road.

The Anaconda copper mine has been opened and the fires are all out. It will take about six months to repair the damage caused by fire and get everything in running order again.

Fort Payne, Ala.

Its Manufacturing Industries.

A few years since the West presented the most marvelous exhibitions of town building. The extension of railroads into unpeopled sections caused cities to spring into existence at favorable points for trade as if by magic. Nothing like it had ever before been seen in any country in the world. Since then a radical change has taken place, and the fever for town building has been transferred to the South. Another change which has occurred is in the motives governing the town builders. The Western towns of which we speak were located mainly for trading or commercial purposes. The new Southern towns are being established as the seat of manufacturing interests primarily, with the trading interests in the background. Among the newest of these new towns is Fort Payne, which is located in the northeast corner of Alabama, in DeKalb County. Here a little hamlet had gradually grown about the site of a old fort used as a Government station when that part of the country was occupied by the Cherokee Indians. Its altitude is about 1000 feet above sea level, and it is situated in a long, narrow valley with the Lookout Mountain range on the east and Sand Mountain on the west. In March of last year the hamlet had grown to be a large village of some 400 people, when new life and energy were infused into it by the Fort Payne Coal and Iron Company, a northern organization, composed largely of citizens of New England. They secured possession of large tracts of land in the vicinity, began to develop coal and iron ore mines, started a fire-brick works, a stove foundry and some other enterprises, built a fine hotel, and have had the satisfaction of seeing the population of the town swell to almost 5000. As other manufacturing establishments now nearly completed will employ over 3500 hands, it will be seen that a substantial basis exists for belief in a still more rapid growth of this thriving New England city in the next year and even beyond that.

At the invitation of the managers of the Fort Payne Coal and Iron Company a number of Western business men recently visited that city, leaving Chicago on May 22. The iron trade was represented in the party by S. D. Kimbark, of Chicago, the well known heavy hardware merchant; Kirk Himrod, of Chicago, member of the pig iron firm of Charles Himrod & Co.; Irving T. Hartz, of Chicago, secretary and treasurer of the Calumet Iron and Steel Company, and by a representative of *The Iron Age*. Other interests of a diverse character claimed the remainder of the delegation, consisting of E. D. Way, of Peoria; J. L. Kamrar, and L. A. McMurray, of Webster City, Iowa; L. J. Clark, of Detroit; T. England, of Minneapolis; and M. C. Baker, C. H. Fargo, E. P. Griswold, T. P. Randall, S. F. Requa, R. P. Smith, H. N. Wheeler, C. E. Crane, and Geo. A. Arnold, all of Chicago. The Fort Payne Coal and Iron Company delegated George S. Smith, Harry R. Godfrey and True P. Pierce to look after the welfare of the party, and they performed that service most acceptably. A special car conveyed them over the Big Four Railroad to Cincinnati, and thence by the Queen and Crescent route to Fort Payne. Every courtesy was shown their guests by the Coal and Iron Company. They were entertained at the company's hotel free of charge. Carriages were provided them so that they might inspect the improvements in progress without fatigue. An excursion was made over the Fort Payne and Eastern

Railroad, built by the company, to provide communication with their coal mines on Lookout Mountain. This road is ten miles long, tops the Castle Rock coal seam of the Black Warrior field at several places, and will be extended ultimately to the Atlantic coast, at Port Royal, South Carolina. It needs to be extended but a short distance eastward to tap several north and south lines of road. A branch is to be built west to Decatur, affording another outlet in that direction. Spur tracks have been built to iron mines in the vicinity. The inspection of manufacturing plants was relieved by a visit of the entire party to Maniton Cave, in the side of Lookout Mountain, close to the city. It is also owned by the company, and was illuminated by hundreds of candles on this occasion. This cave has been explored for a mile and a half, and extends still further. It abounds in lofty halls, curious galleries, subterranean water falls, mysterious side passages and beautiful crystalline formations, constituting one of the permanent attractions of the locality. After thoroughly inspecting Fort Payne a visit was made to Birmingham, but the stay was limited to only a few hours, which simply enabled the visitors to obtain but a glimpse of the marvelous activities of that wonderful Southern city. Taking up the industries of Fort Payne somewhat in the order of their magnitude, the most prominent establishment is

The Builders' Hardware Manufacturing Company.

This is an ambitious enterprise to be undertaken in a new town, but the progress which has thus far been made shows that its projectors thoroughly comprehend the task before them. They have erected a number of substantial brick buildings for iron and brass foundries, pattern and finishing shops, and are now placing in them the machinery, tools and implements, patterns, &c., of the Ireland Mfg. Company, of Cincinnati, whose entire property was purchased for the purpose of removing it to Fort Payne. The capital stock of the new company is \$400,000. They expect to have their works in operation not later than September 1. The main building is 150 feet by 50 feet, three stories high, and is intended for finishing rooms, shipping room and offices. Adjoining it is the engine house, 35 feet by 30 feet. Next comes the brass foundry, 60 feet by 40 feet. The iron foundry is built of corrugated iron, 150 feet by 50 feet, and is connected by a brick archway with the pattern vault, 50 feet by 30 feet, built of brick with an iron roof, so as to be thoroughly fire-proof. The carpenter shop, 100 feet by 40 feet, built of corrugated iron, is located in a convenient position to the main building and will be intended mainly for the manufacture of shipping cases. The plant is most conveniently arranged for the economical handling of material, and is close to the tracks of the Queen and Crescent Railroad. The grounds are large enough to permit of a considerable expansion of present facilities. The company propose to manufacture a general line of builders' hardware, adding considerably to the patterns of the Ireland Mfg. Company. They contemplate the manufacture of knobs as well as the other parts of locks. The patterns now in stock cover all grades of goods, from the cheapest to the most artistic creations of the designer. They will employ about 400 skilled mechanics when in full operation in all departments. The works will be in charge of experienced superintendents and foremen in every department. E. B. Cook, formerly of Portland, Maine, is vice-president and manager, and J. W. Spaulding, C. O. Godfrey and E. B. Cook constitute the executive committee.

The Fort Payne Fire Clay Manufacturing Company.

The works of this company have been completed and are now in active operation, turning out fire brick, sewer pipes and terra cotta and architectural work. They were erected under the direction of W. Garland Taylor, who for over 30 years has had charge of important fire clay works in England and this country. Mr. Taylor was given full power to carry out his own ideas, and he has erected a most substantial and convenient establishment, with very powerful machinery. The fire clay used comes from local deposits of great extent, and it was thoroughly tested with satisfactory proof of its refractory quality before the works were erected. A quarry of white flint was also opened, and from it the material is obtained for the manufacture of silica fire brick. Two railroad tracks run through the works; one to bring in fire clay and coal, the other passing beside the stock house and kilns, for shipment. The main factory is 200 feet long and 80 feet wide, three floors high. The first floor is devoted to the manufacture of fire brick, and contains two steam-power brick machines, and a steam-power re-press, in addition to a number of hand presses. The floor is covered throughout with metal steam plates, under which there is arranged a perfect system of steam heating, with all necessary pipes, valves, &c. The exhaust steam will thus be utilized. This arrangement, while an expensive item as to first cost, dispenses with the continuous cost of coal and labor necessary to produce the heat for drying the fire brick and other product. The second floor, the size of the building, will be used exclusively for the manufacture of glazed sewer pipes. In the center is erected a massive steam pipe press, with steam cylinder 44 inches in diameter, for making the pipes connected with which are elevators and usual attachments. The third floor is set apart for making terra cotta and general architectural work. The machinery annex, 70 x 70 feet, contains boiler room, with two locomotive fire-box boilers, 110 horsepower each, and foundations for a third. The engine room has a highly finished automatic cut-off engine, 200 horse-power. The mill room contains a powerful mill for grinding the flint and fire clay in a dry state, connected with which is a Blake stone breaker, with elevators, screens, &c., also two other large mills for preparing the clay ready for use. A battery of six kilns, for burning fire brick has been built, which will receive 50,000 bricks each. Adjoining this battery of kilns are four large patent gas producers, erected by the Taylor Gas Producer Company, of Philadelphia. The gas generated will be used for burning the fire brick. For burning sewer pipes five round kilns, 25 feet inside diameter, have been completed, with three others to put down. Connected with the boilers and kilns are three chimney stacks, each 105 feet high and 6 feet inside diameter. The works also contain a block of three offices, stock room, 250 feet by 30 feet, and shops for machinists, blacksmiths and pattern makers. The manufactures intended to be carried on, for which the fire clays and flint are particularly adapted, and for which the works and machinery are especially designed, are: Fire brick, for blast furnaces, rolling mills, steel works, glass works, &c.; silica fire brick, for open hearth steel furnaces (made entirely from white flint), now largely imported into this country; glazed vitrified sewer pipes; terra cotta in any design, for which purpose the best skilled designers and modellers have been engaged and are now at work. The capital stock is \$200,000. The officers are: Horatio Adams, 40 Water street, Boston, president; J. W. Spaulding, Fort Payne, vice-president.

(To be continued.)

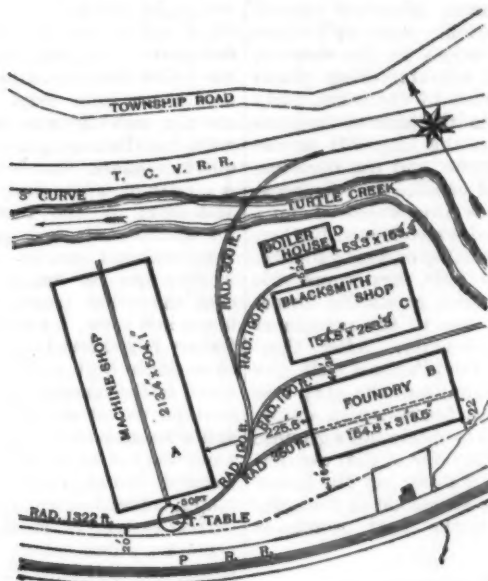
The New Westinghouse Air Brake Company's Shops.

At Wilmerding, a few miles east of Pittsburgh, on the main line of the Pennsylvania Railroad, are the new works of

The principal measurements of this shop are 213 feet 4 inches wide by 504 feet 1 inch in length. The second floor is supported by six lines of iron columns, the stories being 16 feet in clear height. Running the length of the building, as shown in the map, is a main track connecting with a turn table at the front, which unites with a side track leading to the

be used as a storage room, where all completed parts of brake machinery are to be stored. The departure in this sense consists mainly in placing the storage room in the lightest part of the building, and further in placing it immediately adjacent to or alongside the shipping track. It is evident that with this arrangement it is impossible for any parts to get out of reach, or to be so carefully put away that they cannot be found. Across the open space the second floor is connected by three bridges. Two hydraulic elevators run from the first to the second floor, and thereby permit communication and also the conveyance of material in manufacture and also completed articles. The main shop is driven by independent engines, one set being placed in one-half of each wing of the main building, and driving lines of shafting extending longitudinally, and also independent engines placed on the first floor and also driving longitudinal shafts. In this way power is communicated to all of the many small machines which are necessary in the work here carried on.

The boiler shop, located just north of the blacksmith shop, as shown in the plan, is 150 x 50 feet wide. The exterior is finished, as are all of the buildings, in stone work extending 4½ feet above the level of the first floor, the belt course forming the window sills. Above the stonework to the eaves the walls are of brick. The strength of the walls is reinforced by pilasters. The roofs of all the buildings

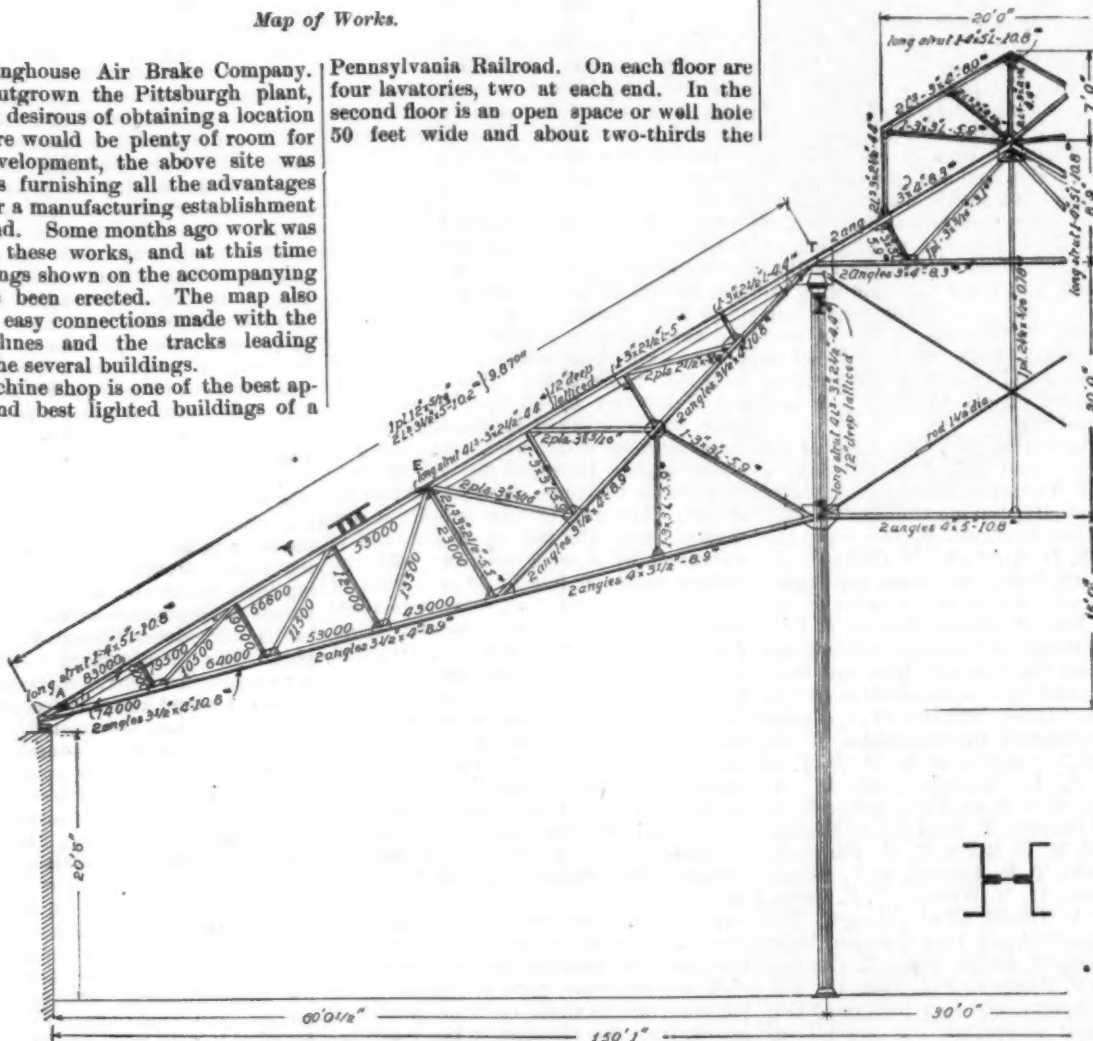


Map of Works.

the Westinghouse Air Brake Company. Having outgrown the Pittsburgh plant, and being desirous of obtaining a location where there would be plenty of room for future development, the above site was selected as furnishing all the advantages desired for a manufacturing establishment of this kind. Some months ago work was begun on these works, and at this time the buildings shown on the accompanying map have been erected. The map also shows the easy connections made with the railroad lines and the tracks leading through the several buildings.

The machine shop is one of the best appointed and best lighted buildings of a

Pennsylvania Railroad. On each floor are four lavatories, two at each end. In the second floor is an open space or well hole 50 feet wide and about two-thirds the



Cross Section of Foundry.

THE NEW WESTINGHOUSE AIR BRAKE WORKS.

similar character in the United States. The large side windows and monitor roof in the center, together with the north and south position of the building, insure the most complete lighting of all parts of the interior.

length of the building, which is lighted by skylights in the monitor roof. It is here that we find the first departure from ordinary practice. The space directly under this skylight on the first floor is to

are of iron trusses covered with slate. Over the blacksmith shop and foundry are continuous ventilators. The blacksmith shop is 283 feet 3 inches long x 154 feet 8 inches wide, and occupies the space

between the boiler shop and foundry. The northwestern corner of the blacksmith shop is at present used as a brass foundry, 90 x 60 feet. The building is one story high, the same as the foundry. The buildings are connected by a tunnel which starts at the boiler house, crosses the blacksmith shop to the foundry, and extends from the blacksmith shop to the machine shop, and from the machine shop to the carpenter shop.

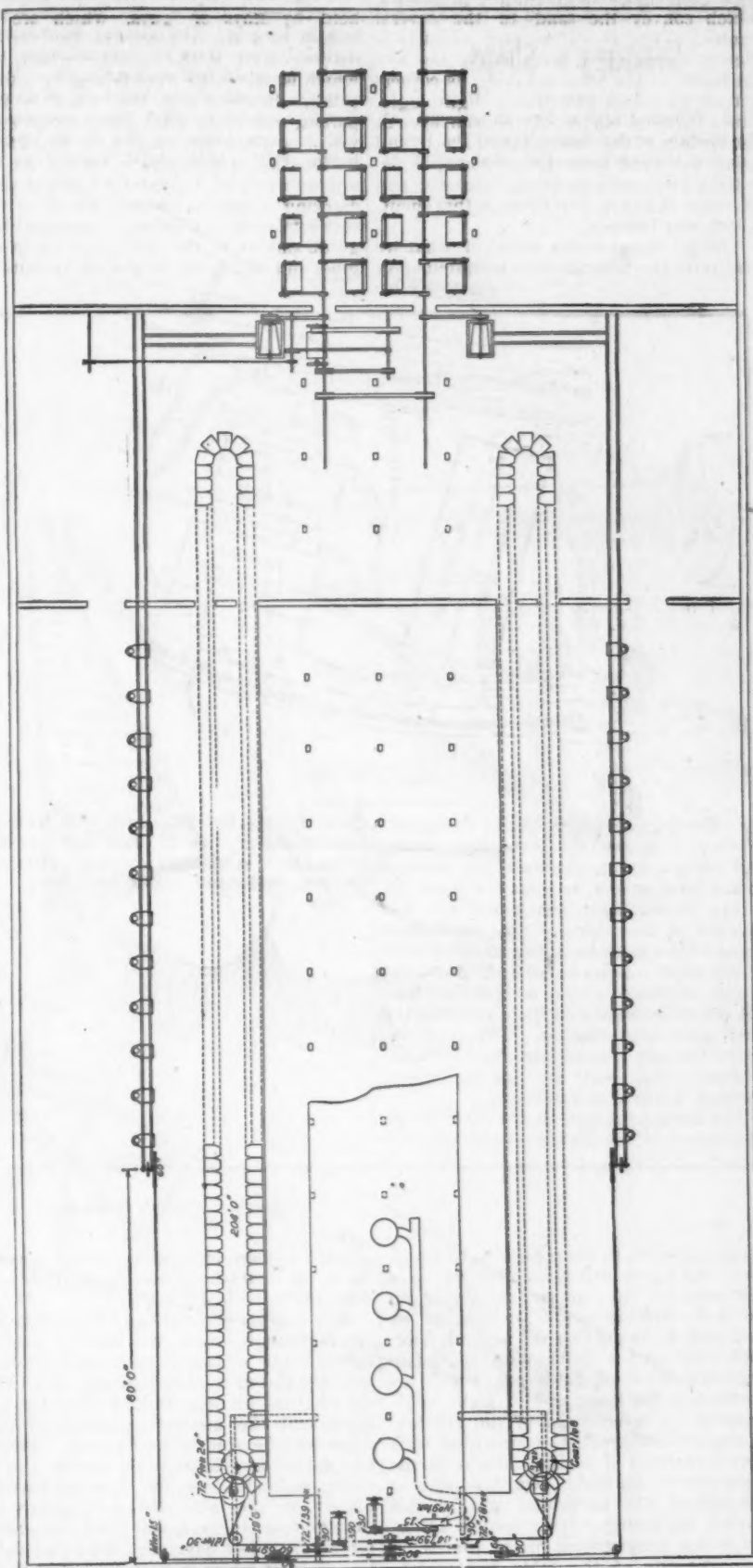
THE FOUNDRY.

It is in the foundry that we find the most novel feature of the entire plant. The foundry building is 318½ feet long x 154½ feet wide. This building is in reality divided into three compartments—first, the casting room, 195 x 150 feet; next, the sand room, 60 x 150 feet, and third, 40 feet in the center of the chipping department is occupied by the cleaning barrels. The charging platform extends the full length of the building, and is 30 feet wide and 13 feet above the main floor level. The section of the building here presented shows the construction of the roof, and in the supplementary views is shown the main feature of the charging platform. The charging platform is supported by three rows of columns. The chipping room is two stories in height, the second floor being occupied by the carpenter shops.

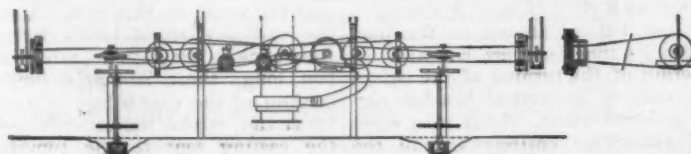
The method of molding here for the first time introduced into this country consists mainly in the employment of a series of tables, so connected as to form an endless chain. The molds are made at one side of this track, and are then placed upon the tables, by which they are conveyed to the front of the cupolas and poured. After that they are taken by the endless table down to the cleaning room, when the sand is shaken out, sifted and returned by conveyors to the molding machines, while the castings are taken to the next room, in which the tumbling barrels are placed.

At the time of our recent visit to the works we were unable to obtain any figures in regard to the efficiency of a plant of this description over the ordinary methods for the simple reason that it had not as yet been in operation long enough to permit the managers to obtain any reliable data, but the opinion was expressed that as far as it had been worked, it possessed decided advantages over the usual methods of making small castings in the molder's time and in the time occupied in subsequent operations.

As shown in the plain view of the foundry, the endless chain of tables is so arranged on wheels as to pass over a sprocket wheel at the upper end, and to be driven by a sprocket wheel placed at the lower end. We may state here that this sprocket wheel is driven by suitable gearing from the engine placed on a level with the charging platform in the second story, the blast for the cupolas also being supplied from this same floor. To the north of the chain of tables, only one of which was in operation at the time of our visit, are placed four or five hydraulic molding machines, made by Alley & MacLellan, of Glasgow, Scotland. We were informed that upon these machines depended the success of the entire plant, and further that these machines were the best that had yet been devised for work of this kind. Further than this, the United States patents for these machines have been purchased by the Westinghouse Company, who will, we presume, at their own convenience manufacture them and place them on the market. At each of these machines the sand is delivered through chutes, which can be closed or opened as may be desired, the conveyor extending along overhead and about on a level with the charging platform, as is shown in the perspective view. We also present a cross section of this conveyor, showing there turning blades, which



Plan View of Foundry.



Vertical Section Showing Driving Gear.

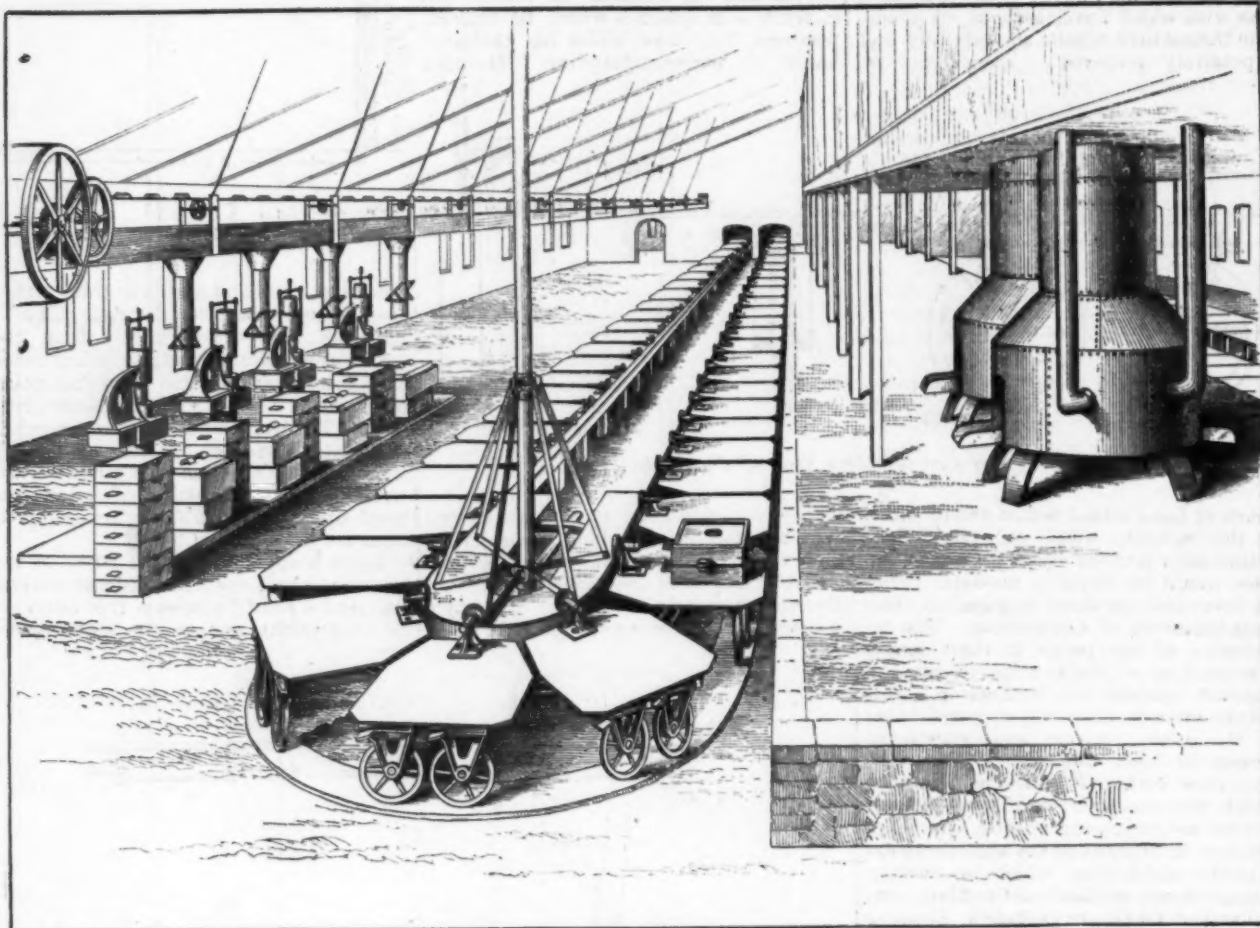
THE NEW WESTINGHOUSE AIR BRAKE WORKS.

do no work, and also the outgoing blades, which convey the sand to the several chutes. This, as will be seen, consists of merely a square box, open at the top and provided with a bottom having its corners cut off by pieces placed at a slight angle. The returning blades of the conveyor fit the bottom of the trough thus formed, and bring the sand from the sieve as it is elevated by the ordinary form of elevator, and of course the sand falls through that spout, which may be open.

The driving sprocket wheel of what we may term the table chain is mounted upon

and that the track carrying this wheel is held by stays or guys, which are attached to a sleeve placed on the vertical driving shaft of the sprocket wheel, and which is prevented from falling by a fixed collar. In this way the track is supported, and at the same time the sprocket wheel is given free play so as to perform its function of driving the table. At the opposite end of the table a vertical shaft carrying a sprocket wheel, which in this case acts as an idle wheel, is mounted in a guide similar to the cross head of an engine, and which can be moved by suitable

cidedly novel features, there has been no hitch whatever, and even on the first day of its running it demonstrated the fact that it was a decided improvement over the old method of hand molding. The precise extent of this advantage is not, as we said before, known, for the simple reason that the plant has not yet been in existence long enough; but from the work it has done so far, and from the few minor changes which have been found necessary, it is predicted that for all small pieces and for shops where there are many pieces of the same kind it will prove to



Perspective View of Foundry.

a vertical shaft, to the upper end of which is secured a gear driven by a worm on a shaft operated by rope transmission from the main driving engine, which, as we have said, is located on the second floor. Each table carries to its outer edge two large wheels having flat treads, which are mounted in the lower end of right angle brackets. The outer end of the horizontal arm of each bracket is provided with a pivot entering a socket formed in the under side of the table. On the outer or free end of the horizontal arm of this bracket are mounted two conical rollers which bear against wear plates placed on the under side of the table, and which, together with the pivot above mentioned, permit the sidewise motion of the bracket carrying the wheel. Two of these brackets and two wheels are placed on the outer end of each table. On the inner edge of the table, which we may state is simply a slab of iron cut as shown in the plan view, with its inner corners cut away so as to permit of the turning of the curves at each end, is a vertical bracket carrying a grooved wheel, which runs upon a track extending entirely around the circuit.

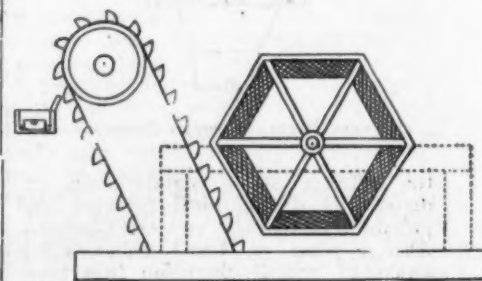
An interesting point here comes in. Of course it was impossible to support the track for this wheel from the floor at the driving end of the table. Therefore we

screw arrangement so as to provide for any slack or wear there may be in the chain driving the table.

At the lower end of the table is placed a sieve through which the sand is passed before being conveyed back, and beyond this are placed tumbling drums, to which the castings are delivered. From what we have said the general operation of the plant will be readily understood. First, the flasks are placed in the molding machine, the mold is made, then the flask is placed on the table directly adjacent to the molding machine, and after the tables for 50 or 60 feet have been filled the endless chain of tables is moved 50 or 60 feet, this bringing fresh molds in front of the cupolas. The molds there present are then poured, and while being poured fresh molds are being made at the opposite side by the molding machines, and in this way the work at this end is continuous, the endless chain of tables being moved from time to time. The table being 204 feet long, there is ample time for the cooling of the cast before it reaches the lower end, where the sand is shaken out, the casting sent to the tumbling room and the sand sifted and returned to the molding machines. The apparatus so far has been found to work admirably in all respects, although a new scheme, and although embodying many de-

be a most decided success when compared with the old method.

The Pillsbury flouring mill system in Minneapolis, sold last year to a British syndicate, is to be duplicated, it is reported, in Kansas City, a beginning in the enterprise having already been made in the construction of a large elevator. In-



View of Sieve and Elevator.

stead of putting the leading business enterprises of the country into foreign hands, as some timid persons feared would be the case a year ago, the *St. Louis Globe-Democrat* says the big purchases by the outside

syndicates serve to enlarge the stock of workable capital in the country, create more extended and active competition, and leave the Americans, as from the beginning, masters of the situation.

NEW PUBLICATIONS.

Fifth Annual Report of the Bureau of Labor Statistics of the State of Connecticut for 1889. 215 pp.; 8vo. paper, with charts. Printed by order of the Legislature.

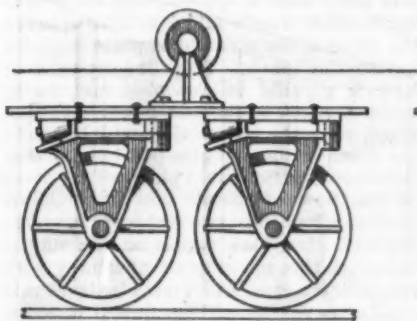
The mediation of the State between employees and capital is beneficent in spirit and valuable in respect to the thoroughness with which investigations are made. The Connecticut reports are carefully and expensively prepared. There are two

and illustrated with handsome plates, give interesting information and constitute one of the most attractive parts of this volume for the general reader.

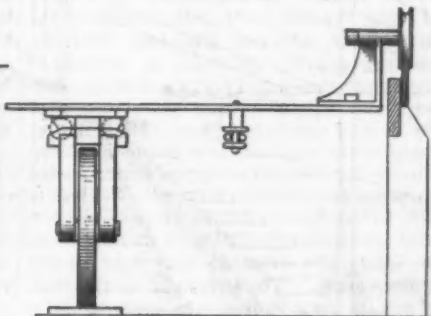
WHOM TO TRUST.—A Practical Treatise on Mercantile Credits. By P. R. Earling, of L. Gould & Co., Chicago. Chicago and New York: Rand, McNally & Co., publishers. 8vo, pp. 304, cloth.

Among the many treatises for the guidance of men learning to do mercantile business successfully this book merits good standing and confidence. It strikes at once at credit, the foundation of commercial life. It concerns the reader, not so much as to qualities which he himself possesses, but those which his customer has in his business standing. The man

therefore, to get such light as this man of experience can give on any particular difficulty to be solved when forming a judgment in one's own business. Credit and capital in their relations to each other—and their interworkings—are very critically discussed on the basis of constantly



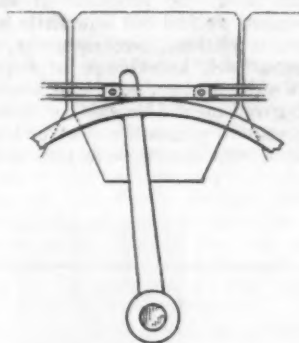
Front Elevation and End View of One Table.



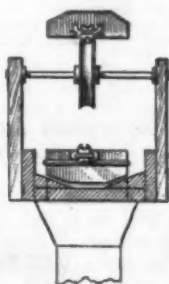
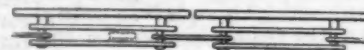
charts of Long Island Sound and its shores in this volume, which only an official examination into the oyster beds and fisheries would be likely to produce. They are invaluable to those engaged in these great industries of Connecticut. The co-operation of the people in these careful examinations of their employments and material concerns is remarkable. This volume gives us a carefully prepared paper on the origin, objects and growth of bureaus of labor statistics in New England, New York and some other States, by which the character and uses of these bureaus are readily appreciated. They constitute a department of the administration of public affairs from which by common consent merely political and partisan control and personnel are excluded. Absolute fitness for the work and truthful exhibits of the questions involved are carefully sought.

The reports of the Seventh Annual Convention of Commissioners of Labor for

who wrote this book must have known men, not theoretically, but personally, in their various characteristics and situations. His relations with them must have been diverse and widely extended. The style is nervous and energetic, entirely as a



Driving Sprocket Wheel and Chain.



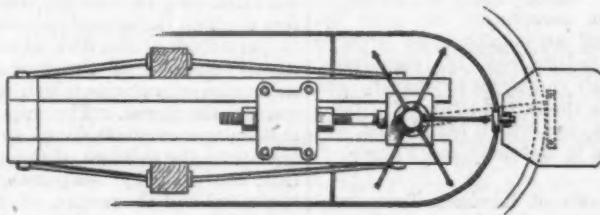
Cross Section Through Conveyor.

the different States contain short addresses by distinguished Senators and prominent authorities on social questions. Also a paper on Child Labor, which awakened critical discussion from many representatives of labor reform. There is also in this report a tabular abstract of manufactures, capital, wages and profits of the State of Connecticut, which is far more worthy of consideration of members of the Federations of Labor than the inflammable speeches of workmen reformers. The statistics of the oyster industry furnished by the State Shell-fish Commission,

business man talks. No space is wasted on rhetoric, and not much time is needed to learn what he means to say. There is a very sharp putting of strong points, and very few humanitarian considerations involved in the conclusions reached by which to guide the judgment.

The question at bottom is always making itself felt, How can you do business with business men successfully? Your

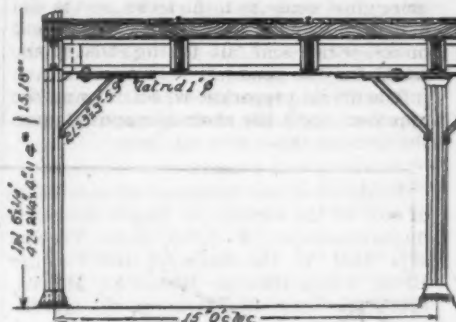
of philanthropy this is more urgently demanded than of old. In the great variety of subjects, upon all of which very decided, and in many cases dogmatic, opinions are advanced, some of the more important are: Nature of the business, locality, character and habits, ability, application and industry, business education, honesty, married or single, capital, assets, volume of business in proportion to capital, antecedents,



Plan of Idle Wheel at Upper End of Tables.

aims or qualities as a philanthropist are not considered. There are a great many topics separately treated in a space rarely exceeding two or three pages. It is easy,

competition, partnership, women in trade, limit of credit, collections, commercial travelers, compromises and extensions, history of the mercantile agency.



Section Showing Charging Floor.

FRUITS AND HOW TO USE THEM. By Mrs. Hester M. Pooler. New York. Fowler & Wells, publishers. 12 mo.; pp. 342.; cloth. Price \$1.

This is a practical manual for housekeepers, containing "nearly 700 recipes for wholesome preparations of foreign and domestic fruits." In the introduction to this book there is condensed in 16 pages more good sense as to dietetics, or the use of natural food for man, than in whole cook books, which send us to the ends of the earth for the products which combined into artificial preparations will tempt the appetite, spoil the stomach and shorten the lives of those who eat them.

Evidence of the existence of vast fields of coal in the vicinity of Puget Sound is unquestionable. A letter from Tacoma says that in the basin of the Cowlitz River, which rises in Mount St. Helens, there are over 40,000 acres, so far untouched. In the Chehalis Valley there are vast deposits still unexplored. In the Carbon River region there is one vast bed underlying three whole townships, one vein which is 24 feet thick, and in it a seam, 8½ feet thick, of perfectly pure coal. In the Ragging River, Snoqualmie, Skagit, Nooksac and Wenatchie basins there are other vast deposits—how vast nobody yet knows. General Alger, of Michigan, and his partners have a tract of 18,000 acres of timber in Skagit County, which there is reason to believe is generally underlaid with a 6-foot vein of coal of fairly good quality. These deposits extend on into British Columbia, and are particularly rich in Vancouver Island, a large part of which is underlaid by them.

James Nasmyth, of steam hammer renown, was never a member of a trades' union, never served his time at any trade, and by the rules and regulations of not a few unions he would have been absolutely debarred from learning the particular business with which his name is so widely associated. The manner in which he entered upon the profession of an engineer, and the reason why he withdrew his capital from it and left it, are alike instructive and remarkable: "You were born in Scotland?" "Yes. I had made myself a good workman without serving any time at all. I had learned to work in metal, and I was a pretty good draftsman, and I came up to Mr. Maudslay and went a little beyond merely telling him what I could do. I brought up some cases of models and of steam engines, and drawings and other things I had done by myself in Robinson Crusoe's time. I came with a hackney coach the next morning full of these things to show Mr. Maudslay. They were all work done by myself, and such jobs they were that I would not be ashamed to put them down beside any piece of good work done this day. The moment he saw them he gave me employment at once of the most honorable and delightful kind. He made me his own private assistant. I was to sit at his left hand, and we worked together for nearly three years." Subsequently Mr. Nasmyth speaks of the persecution he, after becoming himself an employer on a large scale, had to endure from his employees, because of their endeavors to shackle and restrict him in the introduction of obvious improvements, and which led him to employ workmen in Germany and France

*The new town of Kimball, Tenn., was started with an imposing demonstration, on the 24th ult., by the New York and New Orleans Coal and Iron Company. A large number of distinguished persons graced the occasion with their presence. The town is named after H. I. Kimball, of Atlanta, Ga., who is prominently identified with the company.

The Flow of Metals and Its Relation to Testing.

BY PAUL KREUZPOINTNER, ALTOONA, PA.

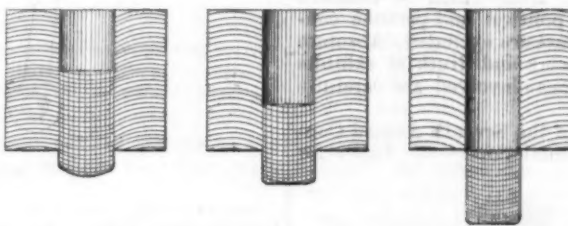
Before entering more in detail upon the subject of the manner and method of testing iron and steel it is well, for a better understanding, to allude to that peculiar and interesting phenomenon known as the flow of solids or flow of metals. The latter term will be used in this discussion as bearing directly upon the subject in question. This phenomenon influences the results of tests and the life of a metallic structure to such an extent that it is excusable to review the matter at length in order to appreciate its importance.

The valuable investigations by Tresca, of Paris, France; * Prof. R. Austin, of the Royal Mint, London, England; Prof. H. Martenz and his assistant, B. Kirsch, of the Royal Prussian Test Department, Berlin,† and others on the phenomenon of the flow of metals have been of the greatest value to the engineer as a guide in determining the value of materials for structural purposes and railroad service. Neglect to give to the flow of metals proper consideration or misinterpretation of its relation to the safety of a structure may lead to evil consequences. The principle of the flow of metals once thoroughly understood, a clearer perception of cause and effect will be the result, though such knowledge should not lead us to release our energy and attention in searching in other directions for the best qualities and properties of metals.

The most intimate knowledge of one property of a metal will not help us to understand all the other properties without careful investigation, and the more we learn about the products of metallurgy the more we find out how little we know. Local conditions, circumstances, raw materials, fuel, knowledge of superintendents, skill, energy, good will, physical well being and mental moods of furnacemen, heaters and rollers are more or less invariable or uncontrollable factors influencing

At least, the writer has frequently observed that steel with a distinct granular structure did not flow as readily as steel showing a "mushy" structure, though both may have been nearly alike in ultimate strength and elongation. The more pronounced the crystalline, and therefore angular, form of the molecules in the one steel probably prevents a ready sliding of the molecules over one another and forces the mass of the metal to move in a body, as it were, instead of the individual molecules acting more or less independently and gliding over each other with ease. Why, nevertheless, the ultimate strength may be the same in both metals the writer will endeavor to explain further on. In soft but dense metals, like the softest grade of boiler steel for instance, the flow goes on so rapidly, especially when an excess of pressure is applied, that the resulting friction creates sufficient heat to make the metal at the point of rupture actually hot to the touch. This development of heat is a guide to the observant tester where fracture of the test piece will take place, since the test section will begin to get warm at the probable point of fracture before contraction takes place. The nature of the flow of metals and other solids manifests itself in numerous ways in everyday life. Ice, lead, copper or iron may be squeezed through narrow apertures with comparative ease, and Tresca believes that even glass can be made to flow if it could be surrounded with a sufficiently strong, yet viscous body.

Every pipe fitter or mechanic who has to adjust or fit long rods and connections frequently finds holes, nuts, couplings or the ends of rods quite out of line. But he knows, though he may not know the reason why, that if he succeeds in entering one or two threads he is all right, because if he screws the pipe or rod up slowly it will adjust itself without breaking, because the force necessary to screw the material home causes the metal to flow and allows the pipe or rod to adjust itself to its new position. Every article of iron or steel which is shaped by hammer or roll assumes its shape by virtue of the flow of its molecules. In fact, all metals must be



Illustrating Flow of Metal in Punching Nuts.

the qualities of the final product. The fact that metals flow and change their form according to their structure and time, pressure or temperature applied, raises at once the question, What is the nature of this peculiar property? Can the rate of flow be measured? Is it perceived with difficulty or does its influence manifest itself to the superficial observer? As to the nature of the flow of metals it evidently consists of the movement of the molecules or particles which make up the mass of the metal. The rapidity of this molecular movement seems to be proportionate to the softness of the metal, modified, however, by temperature, shape of the metal and the nature of the pressure applied.

The structure of the material appears to influence the rate of flow considerably.

* Proceedings of the Institution of Mechanical Engineers, England, 1867 and 1878.

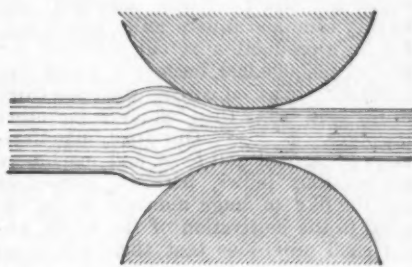
† Mittheilungen aus der mech.-tech-nischen Abtheilung der Kgl. technischen Versuchs-Anstalt, 1888 and 1889.

considered as fluids which can be shaped and molded at will under sufficient pressure. Whoever has noticed the small amount of metal issuing from a hole which is being punched in a nut or tire ingot could not help asking, Where has the rest of the metal necessary to fill that hole gone to? Well, it simply flowed sideways into the body of the nut or ingot, until the resistance to shear the metal was less than the resistance offered by the metal to flow. In other words, the metal will flow away from under the punch just so long as the remaining metal has strength enough to act as a sort of an anvil against which the metal is pressed by the punch. As soon as the amount of metal acting thus as an anvil is reduced in quantity to a certain point, then the punch acts no longer as a hammer driving the metal before it, but assumes the function of a shear, and shears the remaining metal away from the main body of the nut or tire ingot. The accompanying sketches illustrate the above described process.

This flowing of the iron is also a guide to judge of quality, in a measure at least, for the practical millman and the expert. For instance, good, well refined iron will mostly have a razorlike, unbroken burr on the sheared end, due to shearing. If the iron is well worked through and free from an excess of slag, it will flow well before the advancing pressure of the shears and draw out into that fine, smooth edge alluded to. In thread cutting, with dies as well as in the lathe, the iron, especially if the iron is soft, like staybolt iron, swells up before the advancing die or tool, thus virtually increasing the diameter of the bar. Hence the desirability of having bolt iron, especially the soft staybolt iron, whenever it is cut with dies, a shade smaller than the nominal size because the swelling will make it full size and allow a well cut full thread. This swelling may also cause friction sometimes between millman and consumer when the latter asserts that "that iron is again too full," while the former maintains the iron to be "too gauge" and charges the consumer with being "too particular for anything."

Moral: Study the properties of metals.

This swelling is more pronounced in rolling when the iron or steel runs along the bar or sheet like a receding wave before the rolls, as is illustrated, somewhat exaggerated, in the sketch below.



Swelling Under the Rolls.

Illustrations might be multiplied indefinitely to afford an insight into the nature of the flow of metals, and to show that this property has to be taken into consideration very carefully in testing, defining the shape of test sections and determining the value of a metal for a given purpose.

Sir B. Baker, one of the engineers of the Forth Bridge, in a paper read before the Iron and Steel Institute, England,* referred to the property under discussion when speaking of the metal used in that celebrated structure, with the following words: "If the thing were practicable, what I should choose for the compression member of a bridge would be 34 to 37 ton steel, which had been previously squeezed endwise in the direction of the stress to a pressure of about 45 tons per square inch, the steel plates being held in suitable frames to prevent distortion."

He adds: "My experiments have proved that 37-ton steel so treated will carry as a column as much load as 70-ton steel in the state in which it leaves the rolls; that is to say, not previously pressed endwise. At least one-half of the 42,000 tons of steel in the Forth Bridge is in compression, and the same proportion holds good in most bridges; so that the importance of gaining an increased strength of 60 per cent. without any sacrifice in the facility for working and safety belonging to a highly ductile material can hardly be exaggerated."

It is hardly necessary to point out the extreme interest which these remarks from so eminent an engineer have on the subject under discussion.

As to the rate of flow it is difficult to establish a rule for measuring it. It is a

variable quantity being influenced, if not entirely determined, by the quality, structure, temperature, and density of the metal. Sometimes the rate of flow may have a greater weight in deciding on the quality and market value of a metal than strength and elongation. This is the case with rivet material, for instance. The object of riveting is to make the joint as strong as the solid plate. Practically this is not accomplished. The joint can never be as strong as the solid portion of the plate, for various reasons. But by skillful workmanship, proper machinery, and good riveting material a joint can be made which is very much better and stronger than one where any or all of these three essential requisites to a good joint have been lacking. If the rivet hole is not entirely filled by the metal the joint will be defective. Makers of soft steel are ever on the alert to recommend steel for rivets and staybolts as being stronger than iron with the same, or nearly the same, ductibility. It is true there is some fine metal of this class in the market, and what is more, as cheap, if not cheaper, than rivet or staybolt iron. Why, then, do not steel rivets find more favor with the boilermaker? Because steel does not flow so easily as iron does. It is not so much the given number of thousand pounds per square inch of tensile strength which makes a material valuable for rivets and staybolts, but its readiness to flow and fill the hole under the quick pressure that is applicable under the circumstances. Iron fulfills that mission admirably, while steel cannot be depended upon with the same confidence.

In the iron rivet the metal hugs the plate closely, and even completely fills the two small corners where the plates join, thus giving a maximum of friction and solidity. On the contrary, in the steel rivet, owing to the stiffness of the metal, it does not come home solid on the surface and edges of the plates, but leaves more or less of a clearance which necessarily weakens the joint, and for which the higher tensile strength of the steel is but a poor compensation. Moreover, in riveting, owing to the partial compression of the metal, that strengthening of the metal takes place which, as Sir B. Baker, engineer of the Forth Bridge, pointed out, would add so much to the value of a structural metal. Hence the iron when riveted possesses additional strength over and above the strength of the original bar.

In the iron rivet the lines of flow are very distinct and the fibers symmetrically disposed in such a manner as to offer additional resistance to buckling of the plate. In the steel rivet the lines of flow are quite faint, even in the softest grades of steel which carries some slag to give it "fiber." Steel flowing less rapidly than iron under the same pressure, and the time for riveting being necessarily the same for both methods, it is obvious that this deficiency in steel to flow at the same rate as iron in the same space of time must be overcome with the application of greater heat and pressure. However, the former is objectionable with steel on account of liability to overheating, and the latter method does not find favor with the majority of boilermakers, who may not be in a position to discard their riveting machinery and get heavier ones merely for the sake of using steel. The whole argument applies with greater force to hand riveting.

In presenting this question, however, it was not the purpose to militate against steel for rivets but to give, first, a striking instance of the importance of a certain property in metals in everyday practical shop manipulations; second, to cite an example where the question of strength to carry a given load is of secondary importance, in comparison with the ability to flow in a given metal, and third, to show

the length, breadth and depth of the work necessary to get a thorough knowledge and complete insight into the qualities and properties of materials and their proper application with the least waste and expenditure of energy and money.

As to the third question, whether this property of metals is perceived with difficulty and thus be deprived in a measure of its teachings, the answer can be given that, if once understood, we can perceive its influence and effects with ease everywhere. In fact, we are continually surrounded with evidences of the never ceasing activity of this law of nature as revealed to us amid the din and bustle of industrial activity, and it is probably due to the universal presence of this law that the details of its working receive comparatively little attention.

If the writer thus far has dwelt with some length on the property of metals to flow without pointing out its relation to testing, it is because only when we are fully aware of this ever present phenomenon that we can appreciate and realize its influence on the results of testing, and the necessity of interpreting it properly in determining on the quality and value of a material for a given purpose.

This is one of the cases where, with proper knowledge and application of this most important factor, a test department will be of immense value to a concern. On the other hand, it will be worse than useless, if the primary laws and principles which determine the usefulness of materials are not understood or ignored in the vain endeavor to bring everything into the limits of a hard and fast rule. For want of knowledge how to test, time, energy and resources are wasted in microscopical minuteness of detail and pedantry where it is out of place; or may even do absolute harm.

All the useful factors which it is our endeavor to determine in testing, elastic limit, modulus of work, ultimate strength, elongation, contraction of area, resilience, fatigue, &c., are directly dependent on and determined by the rate of flow of the metal we test. Hence the stress laid by the writer on a thorough understanding of the presence and the nature of this peculiar phenomena, in order to conceive that the principle of testing, and of applying the results of testing, to practical service really consists in observing, measuring and describing this phenomena.

In this light the writer will consider the relation of the flow of metals to testing in another article.

The contract for rebuilding that portion of the United States Rolling Stock Company's car works recently destroyed by fire at Decatur, Ala., has been let to George Moxon, who is under agreement to complete the buildings inside of 90 days. The carwheel department of this plant is running steadily, turning out 60 wheels per day. Beside the railroad order they are running an order for the Anniston Car Works, of the same company, and the Louisville and Nashville Railroad machine shops.

The entire property of the Jackson Iron Mining Company has been sold to English parties. Negotiations have been going on for several months, and a company have finally been formed abroad to take up the 12,000 shares of stock at \$125 a share, or \$1,500,000, for the mine. The Jackson property is one of the best on Lake Superior. It has been controlled for two years by William Chisholm and J. H. Ware, Jr., of Cleveland, and Samuel Marshall, of Negaunee, Mich. They bought the stock at the price at which it now sells, \$125 a share, but it has paid \$70 a share in dividends within the two years in which they have held it.

* Proceedings of the Iron and Steel Institute, Vol. II., 1888, p. 497.

THE WEEK.

How the silver question is viewed in Germany appears from a correspondent in Munich, who says: "Germans have long feared the repeal of the Bland bill and the embarrassment that it would cause to the German Treasury, which is a large holder of silver. Now their hope is that Germany may be able to use this chance to unload without too great a loss, so that with her gold standard firmly established she may be able to fish to advantage in the troubled waters of the silver countries. Now, less than ever, will Germany or England make any sacrifices for bimetallism. Why should they, when there is hope that another nation will broaden its back to bear all the common burden?"

An important manufacturing center is springing up at East St. Louis, which enjoys special advantages on account of the nearness of the coal fields and ample railway facilities. Among prominent concerns at that point are the Beef Canning and Pork Packing Works, Little Rolling Mills, employing 750 men; Elliott Frog Works, 150; Fremantle Wire Works, 100 (burnt and rebuilding to double capacity); Illinois Wire Works, 100; Stanley Shafting and Pulley Company, 75; Waters-Pierce and Consolidated Iron Company, flour mills, four elevators, two planing mills, Western Forge and Supply Company, Horn Stave Works, Cotton Compress Company, Hazel Flour Mill, carpenters, contractors and stonemasons, and a large number of smaller concerns. Nearly all the trunk lines have large freight depots and machine shops there, employing a large force of men.

A Philadelphia contemporary on the Atlantic seaboard indulges in mock sympathy over the "decadence" of New York, as follows: "There can be no doubt that the decadence complained of is due to the circumstance that New York as a city has outgrown its conveniences for cheaply and rapidly handling the flow of commerce between the West and Europe. It is built up all around a harbor which is too narrow for the demands made upon it, and this involves a vast amount of jostling and delay, while an expensive and tedious transportation to and from its now badly situated warehouses is an inevitable part of the process of handling a large part of its commerce." That kind of decadence that outgrows conveniences, and whose harbor is too narrow, is of the right sort, so its princely merchants, traders and manufacturers think, and they will try to get as much more as possible, without wantonly exciting the envy of less prosperous neighbors.

The Goubet, a submarine air-tight boat built on a plan which enables it to dive down straight in deep water, is interesting French naval authorities. Its performances eclipse those of the Gymnote, which dives on a gradual plane and betrays its presence by disturbing the water. The most remarkable feature of the Goubet is that it can be steered in any direction and at most surprising angles, all at great speed. The Gymnote is about 52 feet long and just high enough to stand up in. Its motive power is an electric engine of 55 horsepower, worked by accumulators. This motor puts the screw in motion. The downward motion is effected by working horizontal rudders.

The consolidation of New York and Brooklyn in a single municipality is supposed to be an event somewhere in the not distant future. But while a bill to effect this object was pending in the Legislature certain Brooklyn editors were strongly adverse to the measure. Brooklyn has an estimated population of 835,000; New York of 1,800,000. Brooklyn's tax rate is 2.94, while New York's is only

1.95. Brooklyn's bonded debt is \$40,402,203, or about \$4.94 per capita of population. In this she has the advantage of New York, whose debt is \$96,999,284, or about \$5.30 per capita. This advantage is counterbalanced, however, by the greater value of New York's real property, which amounts to \$1,603,838,113, or about \$8.90 per capita of population, while Brooklyn's is \$428,483,681, or about \$5.13 per capita. Thus it is reasoned that Brooklyn would gain rather than lose by the consolidation with New York. Her citizens would become in name, as well as in fact, citizens of the metropolis, and the united municipality would, next to London, become the greatest and richest city in the world.

The entire cut of logs on Puget Sound this summer will be 317,000,000 feet. These figures have been arrived at by a careful canvass of the several counties tributary thereto and combining the season's estimated haul of each. The average price of logs on Puget Sound is \$6.50 per 1000. The high-priced timbers are spars of extra length. They sell at \$10 per 1000, and a good 90-foot spar, 32 inches at the butt and 8 inches at the top, will often sell as high as \$50.

News comes from Stettin that the Vulcan company of Bredow-on-the-Oder have received orders to build a cruiser on the plan of the American Vesuvius, armed with Zalinski's high pressure guns that throw enormous projectiles heavily charged with dynamite. The Admiralty believes that they will play an important role in attacking coast defenses.

The commission to locate the Hudson River Bridge under what is known as the Green bill, passed at the recent session of the Legislature, is now complete, and it is presumed that they will at once proceed to the discharge of their duties. Evan Thomas and Isidor Straus have been appointed by Governor Hill and Mayor Grant respectively, in addition to Andrew H. Green, Frank K. Hain and Charles M. Vail, named in the bill. The act requires the New York terminus of the bridge to be between Tenth and 181st streets, and the bridge itself to be constructed with a single span over the river at an elevation of at least 145 feet above mean high water at the piers, and 155 feet at the center of the span. The Commissioners are authorized to receive subscriptions to the capital stock to the amount of \$300,000 and no more, and when ten per cent. of that has been paid in the corporation is to be organized and to take control.

The resumption of work on full time at the collieries in the Anthracite Coal regions of Pennsylvania is one of the encouraging signs of the times.

The Cooper Union commencement exercises on the 29th ult. drew together an audience that completely filled the hall. Ex-Mayor Cooper presided. Orations were made by John T. Taylor on "The Steam Engine;" by William A. Hausman on "Ancient and Modern Engineering;" by James R. Turner on "Industrial Education;" and by John J. Wrenn on "The Progress of Manufacturing." Ex-Mayor Hewitt, in an address on behalf of the trustees, said that the institution is honestly conducted with money honestly collected, and is an example to others in regard to honesty, accountability, integrity and public spirit. Mr. Hewitt then proceeded to answer Mr. Carnegie's assertion that a college education is not favorable to what Mr. Carnegie calls success in life. College training, Mr. Hewitt believed, does not impede the capacity of men to carry on successful business.

The losses of cattle exporters from New York, on account of the glutted condition of the English market, are so serious that

several of them seek a release from their contracts for steamship transportation. According to one computation the aggregate losses for a single week in May footed up some \$450,000 on shipments comprising 15,000 head. A year ago cattle for the export trade cost \$15 a head less, ocean freights were \$5 to \$7 a head lower and the price in London was 12 to 13½ cents a pound. It is about 9 cents a pound for the best cattle now in London, and the average is not over 8 cents. It is thought that the effect upon the grazing interests in the West may be serious. Another effect should be cheaper beef in the home market.

Secretan, Lavissiere and Hentesch were convicted of conspiracy in Paris, in connection with the broken copper syndicate. Secretan was sentenced to six months' imprisonment and a fine.

The wheat growing capacity of enormous areas in the Argentine Republic, now that efficient labor from Europe has become available, is spoken of as threatening dangerous competition with growers in the United States. On the Parana and Paraguay Rivers there is a single unbroken plain comprising at least 120,000 square miles adapted to wheat cultivation, although at the present time only a comparatively small area is under tillage. Mr. Atkinson comments thus: "One hundred and twenty thousand square miles would suffice for a production at our standard per acre of 500,000,000 bushels of wheat and 7,000,000 bales of cotton, with one-third of the land being then left over for other purposes. * * * Our great manufacturers of agricultural tools and machinery are sending plows, harrows, harvesters and the like in huge numbers to be applied to the cultivation of the wheat, under such provisions that there will be no present limit to the product except the amount of labor and capital which can be secured for it. I know of one single order lately placed in this country for 25,000 steel plows." The physical facts support Mr. Atkinson's conclusion that at no distant day large supplies of wheat might be sent to Europe from this region, especially as railroads are being constructed at a rapid rate, but there is reason to doubt whether labor can be organized so effectively as to secure a high degree of development.

Hospitals for the relief of iron workers suffering from accidents are needed near the great centers of iron manufacture. John H. Krause, of Philadelphia, has offered to contribute \$20,000 toward founding a hospital at Pottstown, provided the citizens contribute an equal amount. A similar effort was started some time ago at Phoenixville. Accidents in the iron mills of Phoenixville, Pottstown, Reading, Bethlehem and Allentown are of frequent occurrence. The removal to a distance for surgical treatment frequently makes so great a demand upon the victim's vitality that fatal results follow from injuries which might be successfully treated if facilities for proper attention could be had in the neighborhood.

The competition of the Canadian Pacific with American railroads formed the subject of animated debate in the United States Senate on several occasions of late. Mr. Cullom offered a resolution calling on the Secretary of the Treasury for information as to the authority under which merchandise in bond and goods of domestic origin are forwarded between the Atlantic and Pacific ports of the United States over the Canadian Pacific Railway, and whether or not such transportation on foreign territory is consistent with the laws governing the coasting trade of the United States; also to report by what authority merchandise other than the products of contiguous countries is per-

mitted to enter the United States under Consular seal, and proceed to destination without entry or examination at the port of first arrival. He explained that there was a good deal of doubt as to what the law now authorized in the premises, and he thought that the Senate ought to know whether anything was necessary to be done on the subject. As it is now goods go up from all the Pacific coast, from Oregon, Washington and California, and are transhipped at Vancouver over the Canadian Pacific Railway, and foreign goods coming from China and elsewhere under Consular seal to Vancouver entered the ports of the United States. An intimation that the resolution covered an intended raid on the Canadian lines of transportation in favor of the trunk lines of the United States was repelled by Mr. Cullom, but it might be, he said, that some legislation was necessary in order to protect American interests against foreign interests on the hemisphere.

Two ships laden with material for the Nicaragua Canal Construction Company are on their way out and another will sail immediately. Four dredges will be on the ground soon, two of them having been started from Charleston.

A huge land grabbing scheme is said to be under cover in the proposal to irrigate arid lands in the West. Major Powell says he is doing what he can to prevent money sharks from establishing a sort of hydraulic feudal system, to which the American farmers would be helplessly subject. In support of his charge Major Powell says: "The profit in their scheme, if it succeeds, may be surmised when consideration is given to the fact that the proposed irrigation of the lands selected by the survey will make 100,000,000 now worthless acres rise to a value of from \$25 to \$200 an acre."

The engineers in building the spans for the Ohio connecting bridge near Pittsburgh will have them put together on the shore, and then thrown into place by towboats. The span will be placed on sunken coalboats, and then Davis Island dam will be lowered, causing high water. The pumps will then be pumped forcing the span upon the piers.

Cleveland has followed the example of Cincinnati in adopting standard time, and accordingly all clocks are to be turned back 33 minutes.

A couple of Russian oil speculators, Michael Strackowski and Vladimir Orloff, of St. Petersburg, who are visiting the Pennsylvania oil regions, say that enough oil is produced in Russia to supply the entire European market, but they have no modern machinery. It is for the purpose of obtaining modern oil well supplies that they are now in this country.

"Biltmore" is the name of the 5000-acre estate near Ashville, N. C., on which Mr. Vanderbilt intends to build a veritable palace, from plans by Richard M. Hunt. The entire cost of the buildings and improvements when completed is reported to be \$6,000,000. A railway has been constructed from the main line of the Western North Carolina Railroad to the Vanderbilt grounds at a cost of \$15,000. Stone will be obtained from neighboring quarries and brick and tiles will be manufactured on the spot.

Mayor Grant's rapid transit commission have engaged two civil engineers to make estimates of cost of possible systems, and estimate the probable amount of opposition to each of the various plans proposed; and a sub-committee, consisting of O. B. Potter and Woodbury Langdon, to consider a financial scheme, and report to the whole committee on or before June 15, when the time for proposing plans ex-

pires by limitation. The opinion was expressed that if the proposed rapid transit route, whether underground or overhead, through the middle of blocks, had to first buy its way at the cost of say \$250,000 a block, and then pay perhaps nearly as much more in damages to owners of property along the line, the bonds of a company proposing to build could not find purchasers.

The railway statistics of Canada for 1889, issued by the Department of Railways and Canals, show that there are 13,325 miles of completed road in the Dominion and 416 miles under construction. These railways represent a paid-up capital of \$760,576,446. The working expenses for 1889 were \$31,038,045, and the earnings \$42,149,615, leaving a net income of \$11,111,570. Over the 12,628 miles in operation 12,151,051 passengers and 17,928,626 tons of freight were carried. The greatest mileage under one system is that of the Canadian Pacific Railway. This road owns or leases in Canada 4,973 miles, the Grand Trunk coming next with 3,114. Forty-six years ago there were only 16 miles of railway in operation in all British North America. The total mileage has doubled in the last 10 years.

The "Big Four" will erect extensive locomotive and carbuilding works at Indianapolis, to employ over 1500 mechanics.

The Pacific Mail Steamship Company's net earnings for the year, were 2½ per cent., after deducting extraordinary expenditures of \$250,403 for repairs on the steamers City of New York and the City of Sydney. The business of the Atlantic and China lines shows a falling off which is more than offset by gains on the Panama line, so that the net earnings exceed those of last year by \$15,000. The cost of the steamship China—\$326,000—has been met entirely from earnings, and she has proved a valuable addition to the fleet. The steamship Barracouta, built in Glasgow in 1883, has been purchased in London at a cost of \$140,000 delivered at Panama. The defeat of the scheme for a steamship line between Tacoma and Japan in connection with the Northern Pacific is supposed to have caused Mr. Gould's resignation of the presidency.

Fine specimens of architecture are being erected in Philadelphia, most notably on Chestnut street. A nine story structure for the Board of City Trusts and the *Telegraph* will cost \$500,000, and the publishers of the *Press* are about to erect a building.

The actual cost of Mr. Goschen's refunding operation with the English debt was only \$232,845 for commissions. The debt was £558,000,000, and there were 169,235 inscribed debtholders, the largest holding £5,760,000 and the smallest 1 penny. When the operations were concluded there remained £8,246,141 in the Bank of England for which no claimants could be found, and may never be.

William Waldorf Astor, in accordance with a desire of his father, contemplates erecting a large hotel on the site of the late John Jacob Astor's residence, at the northwest corner of Thirty-third street and Fifth avenue. Architect H. J. Hardenbergh has the matter in charge. The new edifice will be ten stories high, and will be built of brick and granite. There will be an unbroken Fifth avenue frontage of 100 feet, and a 250-foot frontage on Thirty-third street. Many novel features are promised. The main entrance of the new hotel will be on Thirty-third street, almost at the extreme west of the façade. The entire cost of the new building will reach from \$1,750,000 to \$2,000,000. Geo. C. Bolt, of Philadelphia, will be the lessee.

MANUFACTURING.

Iron and Steel.

The Monongahela Furnace, Company, of McKeesport, Pa., elected the following officers last week: E. C. Converse, president; D. W. Hitchcock, vice-president; C. I. O'Connor, secretary; W. S. Eaton, treasurer, and W. B. Schiller, general manager. This company are erecting two large blast furnaces at the above named place, which will probably be ready for blast about August 15 next. They will have a combined capacity of about 500 tons per day.

The United States Supreme Court has affirmed the judgment of the Circuit Court in the case of the creditors, representing claims amounting to \$1,800,000 against the iron plant of Brown, Bonnell & Co., located at Youngstown, Ohio, and has issued a mandate ordering the sale of the mills, furnaces and properties of the company to pay the creditors. The entire plant has been run by Receiver Fayette Brown for nearly seven years without interruption, except those caused by breakage. The failure of Herbert C. Ayer caused the property to pass into the hands of the receiver.

Extensive improvements are being made to the plant of the Pittsburgh Malleable Iron Company, at Pittsburgh. Several new departments to the already large buildings are being erected, and the capacity of the works will be greatly increased when the work is finished.

Amendatory articles of incorporation have been filed by the McCosh Iron and Steel Company, of Burlington, Iowa, increasing their capital stock from \$200,000 to \$500,000. This is a convincing indication of a most prosperous business enjoyed by this company, who are making extensive additions to their plant in order to meet the demand for their products. The company now employ about 300 hands, and will nearly double their force when the improvements now under way are completed. The local press of Burlington refer to the growth of the McCosh Iron and Steel Company with much pride, believing that the establishment is destined to be one of the largest in its line in the country.

The British Land, Mining and Railway Company, Limited, will erect two blast furnaces and a rolling mill at Stevenson, Ala. W. C. Dabney is the company's agent. J. C. Wall, a native of Alabama, is president of the syndicate interested in promoting industrial enterprises at Stevenson. A contract was closed on the 21st ult. for the erection of a plant by the Stevenson Steel Car Works.

The new foundry of the Trumbull Iron Company, Girard, Ohio, has been put in operation.

The West Superior (Wis.) Iron and Steel Company propose to build a Bessemer works and rolling mill for steel plates, beams and structural shapes.

B. T. Walshe and Timothy Marone, of New Orleans, La., have incorporated the Attalla Iron Company to build a 100-ton coke furnace and rolling mill at Attalla, Ala. The capital stock is \$400,000, paid up.

The blast furnace in course of erection for the Roanoke Iron Company, at Roanoke, Va., will probably begin operations in about a month.

No. 1 furnace of the Glendon Iron Company, at Easton, Pa., has chilled, and No. 3 is in such a condition that it is feared it will have to be blown out.

At the regular monthly meeting of the directors of the Bethlehem Iron Company, Bethlehem, Pa., on the 29th ult., Robert P. Linderman was elected president to fill the vacancy caused by the death of William W. Thurston, and John Fritz, chief engineer and general superintendent, was elected a director to fill the vacancy in the board.

The Pulaski City Development Company have awarded the contract to the American Bridge Company, of Roanoke, Va., for the construction of their 150-ton furnace at Pulaski, Va.

The stack of the North Cornwall Furnace, at Cornwall, Pa., is being raised from 53 feet to 80 feet.

The Newburgh Furnace of the Cleveland Rolling Mill Company, and the Fannie Furnace, at West Middlesex, Pa., have resumed operations.

It is reported that the Vulcan Iron Works, St. Louis, Mo., will shut down on the 12th inst., and the prospects for their resumption at an early date are far from promising. Eastern capitalists, who had been operating the works for the last five years, endeavored to secure a

lease of the works about a year ago, but the St. Louis Ore and Steel Company, thinking to operate the plant themselves, refused to lease again. No. 3 Furnace was started by this company in February, 1889, but now it has been decided to shut down this also.

The Nova Scotia Steel and Forge Company, of New Glasgow, Nova Scotia, have been merged into the Nova Scotia Steel and Iron Company, with a capital of \$2,000,000 and a debenture capital of \$800,000. The company have been formed for the purpose of extending the present business and assuming the franchises and other properties of the New Glasgow Iron, Coal and Railway Company, and to erect blast furnaces and manufacture iron and steel.

During the month of May there was turned out at the plant of the Allegheny Bessemer Steel Company, at Duquesne, Pa., 15,000 tons of steel rails. This plant has been in operation about three years, and in that time has more than doubled its capacity.

Carnegie Brothers & Co., Limited, of Pittsburgh, are putting in 16 additional boilers, which are 28 feet long, with two 7-inch flues, at their Edgar Thomson Steel Works, at Braddock, Pa. The addition of these boilers was necessary on account of the erection of the large blast furnaces H and I.

The plant of the Continental Tube Works, at Pittsburgh, which has been idle for the past three years, has been put in operation again. A specialty to be manufactured is tubular poles for the electric street car lines run on the overhead plan of wires.

Machinery.

The new plant of the Enterprise Foundry Company, in Allegheny, Pa., was put in operation last week. They will make a specialty of light gray iron castings of all kinds. The floor room capacity is over 10,000 square feet, with galleries on both sides 250 feet long and 16 feet wide, for flasks, &c. A side track from the railroad enables them to get all their iron, coal and coke without extra hauling, while their facilities for turning out light castings are of the best. The following are the officers of the company: O. K. Gardner, president; W. H. Burt, secretary and treasurer; and F. G. Reisterer, superintendent.

The Enterprise Boiler Company, of Youngstown, Ohio, are adding to their present plant. One building is 44 x 88 feet, and the other is 26 x 84 feet.

The Merrill Thermo Valve Company, of Pittsburgh, have been incorporated with a capital stock of \$5000. The directors are as follows: Edward C. Merrill, Jacob B. Von Wagner, Robert S. Duffield and A. M. Murdoch, of Pittsburgh; William D. Hartup, of Allegheny, and Thomas L. Shields, of Leet township.

H. K. Porter & Co., builders of light locomotives at Pittsburgh, have completed two mine locomotives which are to be shipped to a point near Piedras Negras, Mexico, where extensive coal mines are being opened by capitalists.

The Porter Foundry and Machine Company, Limited, of Allegheny City, Pa., are building a 50 x 50 feet addition to their foundry, and will soon make further additions, all of which will be fitted out with modern improvements and operated by steam power. The company is behind in orders, never having known a busier season.

The Smith Car Journal Oilier Company, for the manufacture of mechanical appliances to be used upon car journals and axles, have been granted a charter with a capital stock of \$10,000. The headquarters of the new company will be in Allegheny City, Pa. The directors are William T. Paul and George A. McLean, of Allegheny; Frank Scott, of Pittsburgh; William O. Smith, of Newark, Ohio, and Thomas Fletcher, Jr., of Cleveland, Ohio.

Samuel T. Williams, engineer and machinist, of Baltimore, Md., reports that his works are compelled to run at night to catch up with orders for small vertical engines.

William Diebel, president and manager of the Star Machine Company, Philadelphia, announces that he has withdrawn from the Diebel Mfg. Company, of the same city. The Star Machine Company are introducing a number of improved grinding and polishing machines; also the Star emery wheel dresser, patented April 3, 1889.

The Dimon & Johnston Mfg. Company, of Denver, Col., who make a specialty of gimlet pointed wood screw machinery, are now two years behind their orders, and have been compelled to refuse orders for their machines.

The directors of the Exeter, N. H., Machine Works have voted to increase the capital stock \$10,000, in order to introduce into their

works the manufacture of steam heating apparatus. The proposed additions will be three brick shops, 100 x 60 feet, 30 x 45 feet and 20 x 30 feet respectively.

It is reported that the Milwaukee Bridge and Iron Company contemplate the erection of a new plant at Milwaukee. The main building will be 600 x 100, and the works, exclusive of machinery, will cost \$175,000. The working force will be doubled.

The Gainesville Foundry and Machine Shops, at Gainesville, Fla., were destroyed by fire on the 29th ult. The foundry was owned by Joseph Avery, and was not insured.

Hardware.

Thomas L. Appleton, Chelsea, Mass., whose factory was destroyed by fire last November, has rebuilt and his planing and molding mill is again in operation. He will commence at once to rebuild his machinery for the manufacture of planes.

Papers of incorporation were filed May 15, in Pueblo, Col., by the Columbia Screw Company, with a capital stock of \$200,000, all paid. The parties interested in this concern are Franklin MacVeagh, of Chicago; Ex-Gov. Alva Adams, of Pueblo; M. D. Thatcher, one of the leading capitalists and bankers of Colorado; Chas. L. Dimon, Jr., Jno. C. Adams, Jas. A. Joy, Frank M. Dunbaugh and David P. Johnston, of Denver. We are advised that arrangements have been made to locate the plant in Pullman, Ill. The object of the incorporation is to manufacture gimlet pointed wood screws. A large contract for screw making machinery has been given to the Dimon and Johnston Mfg. Company, of Denver, which concern is largely interested in the new organization. It is claimed that the new machinery will be of new and improved designs, and that screws of exceptional quality can be put on the market at a less cost than now possible. It is expected that the plant will be in operation by October 1.

Findlay Rolling Mill Company, operating Briggs Iron and Tool Company, and Sterling Chain Company, Findlay, Ohio, have recently been making large additions to their already extensive plant in that thriving city of natural gas. During the winter they have erected, and have now in full operation on double turn, a sixteen furnace Puddling Mill, two heating furnaces, two scrap furnaces, one 20-inch train of rolls for Muck Iron and one 20-inch bar train. This, with the 10-inch mill also running double turn, increases the capacity of these works very largely, and the grade of iron now being manufactured there, is referred to very high. A large amount of the product of these mills is consumed in the company's plant, which covers about six acres. Their Chain Works have a capacity of over ten tons of Coil and Cable Chain per day, and are in active operation. The Edge Tool Works are running overtime on Axes, Hatchets, Picks, Mattocks, &c. Natural gas is used exclusively in all departments with excellent results, the supply being ample. Among the prospective improvements in the plant in the near future is the addition of an 8-inch Guide Mill to meet the demand for the smaller sizes of Bar Iron.

A charter has been granted to the Gleeves Hardware Company, of Wilmington, Del. The capital stock is \$50,000.

Walpole Emery Mills, South Walpole, Mass., under date of May 26, announce that having completed their new emery mill, built to replace the one destroyed by fire in January last, they are now prepared to furnish their well known brand of Walpole Mills Emery. They state that they have the only mill in the United States built expressly for the manufacture of Turkish emery, the machinery being entirely new and embodying all the improvements suggested by years of experience. They are thus better equipped than heretofore, and reference is especially made to the quality of the emery which they are putting on the market.

Miscellaneous.

The Lansing Wheel Company, of Lansing, Mich., have disposed of their business to the American Wheel Company, who now own or control about a dozen of the largest wheel factories in the country. The amount paid for the property just purchased is said to have been \$150,000. The old stockholders will continue to own the plant, but the American Wheel Company will operate it.

Recently authorized corporations in Illinois include the following:

Chicago Columbus Tower and Construction Company; capital stock, \$2,000,000; incorporators, M. B. Bailey, Bernard McDewitt, Julius Jones, John Kelly and P. C. Harbour.

Builders' Mantel Company, to conduct a general mantel, grate and tile business; capi-

tal stock, \$12,000; incorporators, Henry G. Dawson, W. R. Dawson and John M. Dodd.

Calorific Stove Company, to manufacture and sell calorific and other stoves; capital stock, \$100,000; incorporators, G. Meyers, F. D. Holbrook and F. W. Holbrook.

Wonder Sewing Machine Mfg. Company, to manufacture sewing machines; capital stock, \$500,000; incorporators, H. M. Pettingill, Josiah Pratty and W. W. Watson.

The Hinson Drawbar Attachment Company, to manufacture railway car supplies, &c.; capital stock, \$250,000; incorporators, J. A. Hinson, F. A. Small and J. T. Rehn.

The Damascus Bronze Company, of Allegheny City, Pa., have been granted a charter, with a capital stock of \$50,000. They will engage in the manufacture of anti-friction metals and alloys. The directors are William T. Paul, of Allegheny, and Frank Scott and George A. McLean, of Pittsburgh.

The American Fire Proof Steel Car Company, with a capital stock of \$1,500,000, have been incorporated to build works at Bridgeport, Ala. Work has commenced on buildings 300 x 80 feet, one story in height, two two-story buildings, 80 x 150, and several smaller buildings. The incorporators are John S. Long, of Louisville, Ky., president; F. H. Foster, of Florence, Ala., general manager and vice-president, and R. C. Johnson, of Atlanta, Ga., secretary.

A flood in the Ohio River, at Wheeling, W. Va., swept away the uncompleted channel span of the new bridge of the Union Railroad, at that place. The loss will be \$30,000, and falls on Baird Brothers, of Pittsburgh, the contractors, and on the Edge Moor Steel Company, of Wilmington, Del., who made and delivered the metal.

By the explosion of a blast furnace at the Illinois Steel Works, Chicago, recently, five men were severely burned, one of them probably fatally.

Since starting a branch of the Red Rock Emery Wheel Works in Philadelphia, under the supervision of Charles Heaton, orders have come in so rapidly from old customers all over the country that it has been impossible to fill them promptly, although only a few users of emery wheels in Philadelphia are aware of the fact that there actually is an emery wheel works in their city. Mr. Heaton's new wheel is made as thin as $\frac{1}{8}$ x 18 inches and 24 inches diameter, and is warranted to be safe to run at full speed of 5500 feet a minute.

The Avery Stamping Company, of Cleveland, Ohio, have recently completed what they believe to be the heaviest drawn cylinder heads ever made in this country. They are 9-16 inch in thickness, 18 inches in diameter inside by 3-inch flange, made from a very fine quality of steel, having a tensile strength of 70,000 pounds to the square inch.

The ministerial organ of the Dominion in Montreal distinctly charges that the recent exposé of the United States Senate Committee on interstate commerce is "full of glaring inaccuracies and several perversions of fact." The statement, for instance, that Canada has given the Canadian Pacific Railway bonuses to the amount of \$215,000,000, while the total cost of the enterprise has been only \$167,000,000, is flatly contradicted. What was actually granted in the way of subvention, says the *Gazette*, was \$25,000,000 in money, 25,000,000 acres of land, and completed railway worth some \$30,000,000. The cash subsidy was subsequently increased \$10,000,000 by buying back six and a half million acres of land at \$1.50 an acre, so that the aggregate of aid reached \$65,000,000 in money and 18,500,000 acres of land, or, in all, very much less than half the amount stated in the report of Senator Cullom's committee, and very much less than half the money actually invested in the property. Canadians now claim that the financial success of the road has been fully demonstrated. It has been in operation from Montreal to Vancouver, 2906 miles, for four years, and has branched out and extended its lines till it covers almost every important traffic point in the provinces. Its lines, owned, leased and operative, have a length of 5186 miles. The earnings for the past four years, year by year, show a steady increase. From \$10,000,000 in 1886 they have risen to \$15,000,000 in 1890.

The Iron Age

New York, Thursday, June 5, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR. - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.
JOHN S. KING. - - - BUSINESS MANAGER.

The South on an Enduring Basis.

The traveler through the South cannot fail to be impressed by the evidences of prosperity on every hand. He may have been inclined to discredit the laudatory articles on Southern progress which he had previously read, but the evidence of his own eyes is too convincing to be lightly dismissed. The residents of other sections have heard so much of the Southern boom in real estate and manufacturing property that it is not at all strange that they have been looking forward apprehensively to the time when the boom would collapse with disastrous results. This has been the case in other localities, and it is, therefore, to be expected in the South. But the predicted collapse does not yet come. Waves of prosperity and of depression pass over the country with the effect of increasing the Southern pace during the former and slackening it a little during the latter. The prophets of disaster have not entirely ceased to predict evil times ahead for Southern investments, but they have so often failed that greater confidence than ever seems to be reposed in Southern land and manufacturing schemes.

Sufficient time has now passed since the South entered earnestly into the manufacture of iron to demonstrate the reliability of the basis upon which it rests. This explains the situation and furnishes the reason why the expected collapse in Southern speculations has been so long deferred. Raw materials cheaply mined and lying close together, with but reasonable wages paid to labor, and ready access to the best market in the world for their product—these are the keys to the situation. The success of early enterprises has stimulated the establishment of others, and the stream of gold pouring into the South seems to grow larger in volume rather than smaller. So strong is the tide now flowing to the South that the industries of that section promise to be maintained for years, until some overwhelming financial crisis occurs of world wide effect which will be as severe in Pennsylvania as in Alabama and in Great Britain as in Virginia. Fortunes are being made so rapidly in the South that capital is becoming domesticated there, and auxiliary enterprises which are being undertaken will serve to assist, if not support, those which were first established.

It is a most promising sign of the times, and is as well an indication of the widespread prosperity of the South, that the manufacture of finished products is rapidly being introduced. Many of the new towns now springing up so rapidly in Virginia, Kentucky, Tennessee, North Caro-

lina and Alabama will have blast furnaces, it is true, for their coal and iron ore deposits, make this industry natural and desirable, but at the same time steps are being taken to manufacture some more advanced product than pig iron for sale to other localities. This policy has been preached to the South ever since the beginning of an iron industry there. But the preaching would never have been effective without the great movement now in progress of active business men toward the South. They are seeking locations near the cheapest raw material in the country, so as to get every advantage possible in competing with other manufacturers. The most important question to most manufacturers to-day is how to cheapen the cost of their product so as to preserve a foothold in the trade. And that question is being solved to some extent at least by the movement of factories toward the South, or by the establishment of factories in the South by enterprising men who see a better chance there than in the oversupplied North.

The general prosperity of Southern manufactures will not, of course, prevent failures of individual enterprises. Faulty locations can be selected in the South as elsewhere, and no advantages be realized. Insufficient capital is also a serious drawback in a country which is so slightly developed that the construction of wagon roads must be among the first improvements made. Heavy bonded indebtedness will make profitable enterprises stagger, and may cause sorrowing stockholders to condemn the entire section, because of their bad management of their own particular enterprise. Failures may occur here and there, as in fact they have already occurred among Southern business establishments, but they will not be general; and those who look for such a result to follow the extraordinary activity now prevailing in the South will be disappointed.

Banking Methods.

A short time ago B. E. Walker, general manager of the Canadian Bank of Commerce, published a pamphlet comparing some of the features of our national banking system with Canadian methods. Later, ex-Comptroller H. W. Cameron, president of the Chase National Bank, published a letter criticising the work. Now Mr. Walker publicly replies to Mr. Cameron, arguing in favor of the English branch system of banking. In this feature he presents a strong case; for, as he says, a branch bank, if only one out of twenty others, is on a more secure basis in the interest of depositors than one of our national banks among a like number. The failure of a branch to make both ends meet is not a declaration of insolvency, as the parent bank is amply responsible. The number of recorded failures of American banks, comparatively speaking, is large. With a parent and branch system highly capitalized, these failures would very likely be greatly reduced. As Mr. Walker urges, interest rates throughout

the East and West would be equalized, and we would not have such unjust relations as 12 per cent. in Washington Territory and 5 per cent. in Boston. Our system of national banking may not permit such branches, but our State banks could adopt some such method. They could have a central bank, say in New York, and branches in all parts of the country. So long has this method been in vogue in England that an Englishman fails to understand why it is not in force here. The difference in interest rates certainly should stimulate the creation of such a bank. Branch bank managers, when trained to their work, would be fully as likely to make their branches profitable as the average Western bank officers, who frequently know little about the business when they start. In fact, such a trained manager would prove all the more competent because his position, pride and lack of acquaintances who must be accommodated would tend toward more conservative methods in making loans.

The Canadian system of issuing bank notes is in many respects like that of England, the bank's assets being their sole security. This feature is something like our State bank system before the war, which few of our merchants would care to see reinstated. It has its advantages in expansibility, meeting mercantile needs in case of money pressure far better than our National system; but the risk to note holders more than offsets this advantage. Besides, it increases a bank's chances of failure by increasing the volume of demand money in case a run is made upon it. Naturally, Mr. Walker seeks to show the merits of this particular feature of note issue, since the Canadian law expires next year and Canadian banks will not willingly do away with their note issue privilege. It is altogether too profitable, and we may safely add that it is so at the expense of the people. Mr. Walker strives to show that his bank issue of notes is just as strong as ours, founded upon Government bonds; but we fail to see that the facts he gives warrant the conclusion, and there are few bankers in this country who do not agree with us. At the same time, under existing conditions, a comparison is hardly in order, for our National note circulation is too profitless to be maintained. Consequently it is only a question of time when our National bank notes will be entirely withdrawn from circulation. To-day they yield no profit, owing to the premium on the bonds, the tax and the rate of interest they bear.

Mr. Walker insists that the English method of bank examination is superior to our own. He describes the Canadian bank examiner as one of the bank's officers, who is a carefully trained expert, and in Mr. Walker's opinion is superior to our examiners who have no such training. This expert visits irregularly every branch, carefully goes over all the assets, and inquires into all loans, their standing, &c., in a far more exhaustive manner than do our examiners. He then reports his findings to the parent bank officers. Mr. Walker expresses satisfaction at the fact

that no Government inspector is permitted to investigate the private affairs of Canadian banks, as such a proceeding is "indefensible." We, of course, know nothing about what bank affairs Mr. Walker wishes to conceal from administrative investigation, but since a bank is a semi-public institution, at least so far as its depositors are concerned, secrecy in its management invites fraud. There should be no valid objection by an honest bank officer to an examination of his bank by a disinterested public examiner in the behalf of depositors. English bankers speak as emphatically against our system in this particular as does Mr. Walker, but we fail to see why any bank depositor should prefer the English method of examination to ours. Mr. Walker hints at the danger of carrying professional secrets if a public officer looks into the affairs of a bank. We have heard no complaints of the kind here. A well conducted bank should have no professional secrets—that is, none that would not bear investigation by the Government.

Admitting all the facts Mr. Walker presents, there is nothing to show that the Canadian system is superior to our own, except in the point of the economy under the branch system. In fact, if the Canadian people carefully look into our method before renewing Canadian bank charters, they may see fit to convince Mr. Walker that they do not fully approve of his argument.

Iron Districts and Geographical Boundaries.

Comparisons are going the rounds, and are being discussed in some of the trade journals, of the pig iron production of certain sections during the past decade. In the case under discussion, the debate turns on the relative output of the six Western States of Ohio, Indiana, Illinois, Michigan, Wisconsin and Missouri, and the nine Southern States of Alabama, Tennessee, Virginia, West Virginia, Kentucky, Georgia, Maryland, Texas and North Carolina. We do not believe that comparisons of this character have any significance, because they are vitiated by the fact that they are based on purely political boundaries.

The groups into which the iron industry of the United States naturally divides do not happen to coincide with the political boundaries. The considerations which determine this grouping are sources of supply of raw material, methods of manufacture, products and other markets. A striking example of the fallacy of grouping in any other way is furnished by the Wheeling district. It seems absurd to group among the Central Western States the nail and steel plants, with their furnaces on one bank of the Ohio River, and to turn over to the Southern States the establishments facing them on the West Virginia side of that stream. The whole Wheeling district should consequently be included in the Central Western group. The Pittsburgh district, the Shenango and Juniata Valleys, and the plants located in that part of Pennsylvania lying

west of the Allegheny Mountains belong naturally to the same great district. Practically they draw from the same sources for their ores and their fuel. They pursue the same methods, turn out the same line of products, seek the same markets. It seems to us a question whether the Kentucky industry should not be added to the same group.

Then, again, Maryland cannot be fairly included in the Southern list. Its greatest plant, that of the Sparrows' Point extension of the Pennsylvania Steel Company, groups naturally with Eastern Pennsylvania. We question, too, whether it is fair to include in the comparison the charcoal iron industry of the different sections. We may frankly confess that we attach very little importance to the statistical distribution of product by States. To the student of the iron trade of the country there is far more significance in the figures of output of certain sections. Thus the total pig production of Pennsylvania means very little, the output of Allegheny County, the Shenango Valley, the Schuylkill, Lehigh, Susquehanna, or Lebanon Valleys means a good deal. James M. Swank has long recognized this and has arranged his figures accordingly. In the same manner, in the nail trade, he gives figures for the Wheeling district and for Central Pennsylvania. The table which he publishes, and which our contemporaries are now discussing, is interesting in its way, but it is not intended for nor does it furnish the material for the comparisons which they have drawn.

If we were to seek for the proper grouping, we would take together New England, New York, New Jersey, Eastern and Central Pennsylvania and Maryland as one; Western Pennsylvania, West Virginia, Kentucky, Ohio, Indiana, Michigan, Wisconsin and Missouri as another, and Alabama, Tennessee, Georgia and Virginia as the third.

Standards of Commercial Integrity.

An epidemic of embezzlements, peculations, financial irregularities, and not a few flagrant instances of breach of trust, seems to have broken out afresh. The condign punishment of Jacob Sharp, Ward, Jaehne and the horde of boodlers, who found refuge in Canada, has apparently exerted no influence to deter others in the reckless scramble for pelf. Cupidity is ever the ruling passion, and there are not a few who, impelled by a resistless greed, place themselves within the grasp of the law, and presently are found arrayed in prison garb. Just now we read of some Philadelphia financiers who, by making fictitious paper and other alleged fraudulent practices, wrecked two concerns reputed to be in good standing, the Bank of America and the American Life Insurance Company, and report says that perhaps \$500,000 to \$1,000,000 are lost to stockholders and depositors. Again, the City Bank of Albany is plundered, and a hitherto honored scion of the old firm of William Gould & Son, law-book publishers, a firm that had been in existence 86

years, is charged with criminal complicity. This startling event was almost simultaneous with the bankruptcy of the long respected brokerage firm of George K. Sistare's Sons, in this city, growing out of transactions in the handling of funds which, to say the least, were of a very questionable character. More surprising, and more to be deplored in some of its aspects, was the financial lapse of Wm. H. Guion, whose name for many years was a synonym for commercial integrity. As head of one of the most prosperous firms of shipowners in the Liverpool trade few were more honored, but in an evil day, so it was charged, trust funds were deliberately purloined.

Meanwhile, the criminal trial of the Lenox Hill Bank wreckers was in progress, making lamentable disclosures of embezzlement, abuse of official position and breach of trust. The sequel is found in the criminal records of the past week, the chief actors, Pell having been convicted in a State court, and Claassen in a Federal court, for offenses that admit of no palliation, but that, nevertheless, are too often paralleled by those who indulge in desperate speculation with scarcely a word of reproach. To all of the latter class the event comes home with telling force. It is made obvious, for example, that there is a line just beyond what is termed the limits of "legal morality," where it is exceedingly dangerous to go. Still another point of striking significance is brought out conspicuously by a contemporary, who says: "Both in Pell's case and in Claassen's the court declared explicitly that the law could take no note of any restitution of the property of others of which the prisoners had taken possession. It was larceny in Pell to take the securities of the Lenox Hill Bank for any use whatever, no matter whether the loss were afterward made up or not. It was misappropriation for Claassen to make the loans he did, or to connive at the purloining of the securities of the bank of which he was president, if he knew that the purpose was to pay for the shares sold by the former president. This is the law, embodying the plain and universal principle of common honesty, and no sophistry as to the intention to repay, return, or replace the property of others is allowed, where justice is done, to stand between the offender and prison."

A number of years ago Judge Hopkinson, of the United States District Court, delivered a lecture in New York and Philadelphia which might be well repeated to-day, in reference to the latest phases of "larceny" and "misappropriation," the mildest terms admissible in treating of a heinous crime. "This vast confidence in the future," he said, "this delusive expectation of rapid wealth, has induced many, perhaps honest and honorable until thus tempted, to lay their hands on funds held in sacred trust, seducing themselves with the belief that they could so employ them as to enrich themselves and restore the plundered treasure undiscovered." As our laws so often fail to take cognizance of the imposition and

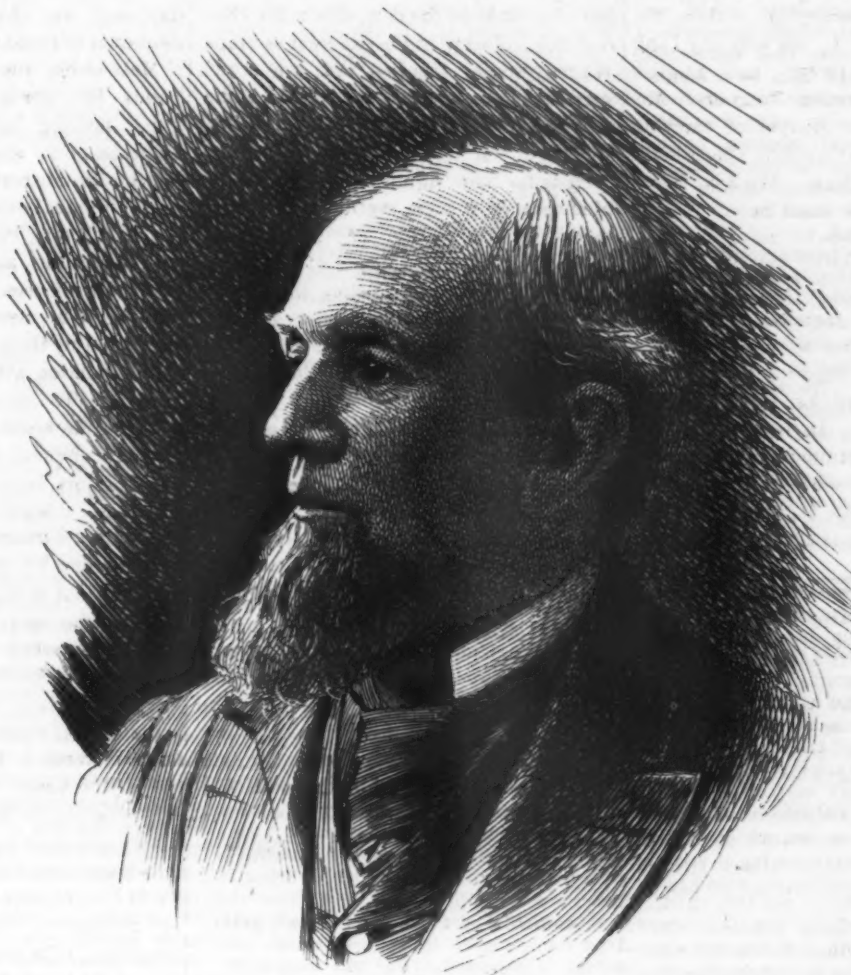
wrong growing out of the dimly defined relations between debtor and creditor, of which those mentioned are only some of the ever varying phases, it would seem to be an inexorable necessity to visit with unsparing condemnation those who offend, and to inculcate by reiterated precept those principles of integrity which alone constitute the basis of all honorable and successful dealing. Social ostracism as well as penal conviction cannot be too severe in seeking to maintain the standards of business integrity. At present, it must be confessed, these conditions are too fre-

J. W. Sloss.

In the death of Col. J. W. Sloss, of Birmingham, the South has lost one of its most progressive citizens. He was the pioneer iron manufacturer of the Birmingham district, and much of the South's iron development of the present day is due to his farseeing discernment, indomitable energy and modern ideas.

His death occurred at Birmingham, on May 4, of heart failure. He was born in Alabama in 1820, and had therefore attained the ripened age of 70 years, when he was called away from the scenes of his industrial triumphs. In his young manhood he moved to the town of Athens in

office until 1877, when he retired from his other business engagements. After the completion of this road he found that a large portion of it ran through a country which was solely agricultural, and yet too poor to produce sufficient freight to pay the expenses. This investigation showed that the road would have to rely upon lumber, and if iron and coal in sufficient quantities could be found, to build furnaces and open coal mines. He had experts make investigation, and the results of their examination convinced him that something could be done in this line. He and his friends then bought the iron ore property, now known as the "Eureka Company," and began the erection of a



J. W. SLOSS

Born 1820.

died 1890.

quently ignored. Vice is gilded and crime is called by mildest names.

The Navy Department has received nine requests for plans of the three steel tugs, over which there was a difficulty of award last year, and a final rejection of three of the bids received. The firms which have evinced a willingness to bid on the tugs are: The Atlantic Works, East Boston; the Portland Iron Company, Portland, Maine; Leafie & Levy, Philadelphia; Robert Gray, New York; W. & A. Fletcher Company, New York; J. H. Drologue, Camden, N. J.; Samuel Moore & Sons, Elizabeth, N. J.; Vulcan Iron Works, Chicago, and P. J. Bradford, of Baltimore. There have been certain minor changes made in the plans, especially in the equipment, and the appropriation available—\$35,000 for each tug—is regarded as a reasonable one.

the Limestone County and engaged in mercantile business. Along in the years following 1850 he conceived the idea of building a railroad to connect Decatur, Ala., with Nashville, Tenn., which road would pass through his home. By dint of energy and determination he in time accomplished the construction of this road, known as the Nashville and Decatur, and became the first president, occupying the position until failing health in 1887 necessitated his retirement from business. The Nashville and Decatur was not his only railroad success. Between Decatur and Montgomery, a distance of nearly 200 miles, there was no railroad, and he determined to build one, which he set about doing in 1858. Much of the grading was done when the war came on and he had to suspend operations. After the war he returned to his task, and he had the satisfaction of seeing the road completed. He was made president, and retained the

coke blast furnace, after the completion of which a coal mine was opened on the line of the South and North Railroad, but the coke proved of poor quality, and in seeking for a suitable coal the celebrated Pratt seam was developed.

He and his friends operated the Eureka Company quite successfully until the latter part of 1879, when they sold out and organized the Sloss Furnace Company at Birmingham, Ala., he being the president of the company. The furnaces that were built by that company were supplied with Whitwell hot blast stoves and all progressive modern appliances. For several years great difficulty was experienced in successfully operating this plant, but gratifying success was finally achieved, and the problem of making uniform iron satisfactory to the best class of consumers was solved, and large shipments of iron were made into the cities of New York and Philadelphia in competition with the

foundry irons of the country. Upon the appearance of failing health on his part the company decided to wind up their business and sold out to the Sloss Steel and Iron Company, under which title the business is now conducted.

Colonel Sloss lived all his life in Alabama. He was an enthusiastic believer in the material possibilities of the South, and especially in those of his native State, in whose borders a wonderful transformation has taken place as the outcome of his initial efforts years ago. His cherished aim after the war ended was to bring about a diversification of industries in the Southern States. He was quick to perceive that the abolition of slavery would produce changed material conditions in the South, where agriculture could no longer remain the only wealth producing power. He saw at once that the South would have to enter the lists as a manufacturer, and as a diversified one at that. He lived to see the day when this idea was grasped, in a great measure, by the more progressive people of the South, as is shown by the tremendous strides they have taken since the shackles of negro slavery were thrown off.

Since his retirement from active business life he had his heart very much set upon the question of producing steel from Alabama irons. He did not share the belief of Samuel Noble, the founder of Anniston, that it was not yet time to try to make steel in the South. He took a lively interest in everything looking to the culmination of successful steel making in his section, believing that when this was accomplished the last remaining obstacle would be overcome that stood between the iron producing district of the South, and the most unbounded industrial success.

American shipbuilders are beginning to devote more attention to the work of sheathing ships. There has been too much carelessness in this matter, and many of the sheathed ships find their bolts eaten away by the galvanic action of their copper before they are half through their first cruise. *Broad Arrow* attributes the shortening of the Calliope's stay on the Australian station to this very defect. In her case the wood used was elm, which, being soft and porous, sucked up a lot of water. It is practically impossible to avoid galvanic action when there are two thicknesses of wood sheathing put on. One being bolted to the ship and the other to the inner thickness results in metallic contact between the nut securing the copper and the bolts securing the woodwork. In 1888 the Admiralty's Bureau of Naval Construction, in a spirit of fresh economy, sought to obviate this difficulty by using only one thickness of wood, driving the bolts in very far, and using short nails for the copper, so that the electric current was obliged to pass through an intervening $\frac{1}{2}$ inch of wood. This plan, however, is already proving a failure, and the double-layer sheathing is again contemplated, together with a system of tests with a galvanometer, which locates the current.

The stockholders of the Cambria Iron Company, at a special meeting, authorized the directors to issue 20,000 shares of new stock for the improvement of the plant at Johnstown. There was some discussion regarding the price at which the new stock should be sold, and the directors were given full authority in the matter of disposing of it.

The systematic plundering of lighters in New York harbor, when laden with sugar, coffee, iron or cotton, is an evil of long standing and difficult to suppress, because lightermen, junkmen and watchmen are too often in collusion.

The Basic Open Hearth Process.*

BY N. KJELLBERG.

PUTTING IN THE BASIC MATERIAL.†

In ramming in a hearth made of a mixture of basic material and tar it is generally used in a warm condition, either directly after it has been prepared or subsequently. Frequently the rammers are heated to a red heat. The reason for this method of procedure is that in a warm condition the mass is more plastic, although sometimes the cold material is rammed in with cold tools. In every case the ramming is done in layers. Thus, for instance, one establishment put a 200 mm. lining, measured at the tap hole, into an 11-ton furnace. It was rammed in of thin layers with hot rammers, requiring 15 layers for the thickness stated, which were put in in five 12 hour shifts by 12 men in two gangs, alternating at work every half hour. When the ramming was completed the drying and burning were begun, which generally took six days. During one day the heating was done with wood and second class coal, and afterward with gas. When the side walls are made of rammed material this is done in iron molds placed on the hearth screwed together. When cold rammers are used the surface of the latter is occasionally covered with tallow or dipped into oil, in order to avoid their adhering to the mass. The same is done for a similar reason with all of the molds. If a new lining is to be put on top of an old lining, the latter is thoroughly cleaned and given a coat of coal tar.

Magnesia brickware is occasionally put in with and at other times without mortar. The latter is pulverized, screened magnesite, to which as a binding material coal tar or thin slate, dolomite or water alone is added. When tar mortar is employed the quantity of the binding material varies within wide limits. At one works it is much less than that employed with ramming material, while at another establishment the tar predominates to such an extent that it is nearly in a liquid condition. In building masonry with magnesite brick the following method is adopted: A thin layer of dry, finely ground magnesite is evenly spread over the finished brick in place, and it is upon this layer that the next course is provisionally loosely laid. After removing the last course, warm, thin mortar, a mixture of tar and magnesite, is put on, mixed with the dry magnesite powder under it, and then the brick are laid upon it, having been previously dipped into the tar mixture. After closing the tap hole, a mass of dolomite, lime or magnesite, mixed with tar as a binding material, is employed. It is only at Dörschgoer that raw dolomite, crushed to pea size and moistened with water, is employed. Another establishment uses for this purpose magnesite, with clay as a binding material, filling the upper part of the tap channel with sand, the temperature at that point not being high enough to lead to disagreeable results.

THE CHARGE AND THE PROCESS.

While the basic Bessemer process is limited in the materials it employs within a certain range, the basic open hearth is not so circumscribed. The province of the basic converter is almost exclusively to treat pig iron low in silicon and high in phosphorus. On the other hand, it is possible in the basic open hearth furnace to utilize, with one single exception, almost any iron material offered. Like the

* A report of a visit to German, Austrian and French works in 1888-89; papers in the *Jern Konterets Annaler*, 1889, No. 7. Translated for *The Iron Age* by Dr. Leo, of Coblenz, Germany.
† For simplicity's sake, the term Basic Material and Basic Process will be used to include neutral chrome ore and the neutral method.

basic Bessemer the basic open hearth work dephosphorizes, and can, therefore, be employed to work material high in phosphorus; but in order to reach a sufficiently high temperature it does not, like the basic Bessemer, call for a certain minimum phosphorus contents, and can, therefore, work raw material within a very wide range. Finally, it is not as closely limited as the basic Bessemer in its specifications on silicon in the iron, because the drawbacks of an acid slag in the beginning of the operation can be more readily neutralized by additions of lime and withdrawal of cinder in the open hearth furnace than they can in the basic converter. The conclusion should not be drawn, however, that pig iron low in silicon is not preferable for basic open hearth work to pig high in that element. It will be readily understood that the opposite is the case. The only obstacle to the working of any kind of raw material in the basic open hearth furnace is a large percentage of sulphur. The character of the raw material is dependent, of course, upon local conditions. In those sections in which the ores of iron are phosphoric raw material is apt to be an iron high in that element. In other sections it is often the case that the basic open hearth furnaces employ the same iron which is used in acid works. In the latter case the basic method is chosen partly when the object is to utilize outside raw material high in phosphorus, which can be cheaply purchased; but even for such establishments, dependent by natural conditions upon a pure pig and using scrap similar in character, so that no low grade material is purchased in the open market, the basic open hearth process affords certain advantages.

The materials used in the basic method are pig iron, wrought and steel scrap, iron ore, spiegel, ferromanganese, ferrosilicon, and in producing the proper character of cinder, calcined or raw lime, fluorspar, roll cinder or hammered cinder.

Pig Iron.—Practically the phosphorus contents of pig iron do not present any obstacles to the utilization of the open hearth method. A large percentage of silicon in the pig iron does interfere with the dephosphorizing and unfavorably influences the life of the lining, but other conditions being equal, the temperature of the bath increases with the silicon contents of the pig iron, and a certain amount of it must, therefore, be best for basic open hearth work. The silicon contents of the iron varies not alone in different works, but also in the different grades of the same pig iron. It generally lies between 0.2 and 1 per cent., but pig going as high as $1\frac{1}{2}$ to 2 per cent. is occasionally used. The table on page 957 of a composition of iron used in basic open-hearth furnaces at different works may serve as an example.

Scrap.—Wrought iron and steel scrap of different kinds are employed widely. Besides the scrap produced at the works, large quantities of material are purchased in the open market, and old steel rails. According to the analysis made by two works, the latter range between 0.3 and 0.6 to 0.5 and 1 per cent of phosphorus, the latter containing also .07 to 2 per cent. of sulphur.

Ore.—Although the basic method allows of the utilization of ore for converting in a more extensive manner than does the acid method, ore was used only in exceptional cases at the works visited. The reason, therefore, is that scrap is obtainable, while suitable ore is difficult to obtain. The process requires the charge to be low in sulphur and the cinder highly basic. Therefore the ore to be suitable for the basic method must be low in sulphur, low in silica and high in iron, the latter in order to reduce the quantity of cinder and to avoid slow work.

The Composition of the Charge.—In all the works visited the principal constituents of the charge are pig iron, wrought iron and steel scrap and some wrought iron ore. The preparation of the different materials of course varies within very wide limits. When ore is employed largely the pig iron charged is proportionately increased and that of scrap decreased. The proportion of the different materials is influenced also by the quantity of scrap produced by the works themselves. Generally the charge of pig iron varies between 20 and 40 per cent., while the charge of scrap fluctuates between 60 and 80 per cent., not counting additions of ore, manganiferous iron and ferrosilicon. Only one Austrian works uses 80 per cent. of pig iron in 8-ton charges, and 400 to 500 kg. of rich iron ore, the latter generally in the beginning with the pig iron. On the other hand, one establishment in France, which has access to an exceptionally large quantity of scrap employs only 10 to 20 per cent. of the

of large furnaces the charging is done by ten men through two working doors. The limestone is either introduced first or simultaneously with the iron, often in large pieces which soon break up in the furnace and can be readily distributed. If iron ore is employed in any considerable quantity it is usually added during the charging. Otherwise the charging operation is like that usually employed when subsequent additions are necessary: after first melting down when the bath has become too cold to allow tapping or when it is desirable to increase the fluidity of the charge small quantities of gray iron are added, the amount depending on the circumstances of every individual case. At Diosgyor the regular practice is to add pig iron after the first charge, and also own scrap low in phosphorus to the extent of 10 per cent. in two or three lots. At the same works a pre-heating furnace serving two open hearth furnaces is employed to heat all the material which can

careful practice in this respect. Therefore the different works do not follow any generally acceptable rule. It does occur, however, that even before the entire charge has been melted down a part of the slag is tapped off in order to facilitate the melting of some pieces. In this case, however, the material operated upon is, on the whole, fairly low in phosphorus, so that the final product is low in spite of the method followed. It is usual to arrange for the tapping of the slag in the following manner: The dam arranged in front of the door is opened and the cinder is drawn off with a shovel. Sometimes, too, the middle door is arranged at so low a level that it flows out by itself as soon as the dolomite dam in front of it has been pierced.

The Last Stages of the Process.—After the charge has been melted and the slag has been drawn, the additions of ferromanganese or ferrosilicon are in order, and the tapping of the product is necessary. The former are arranged according to the character of the forging test and the nature of the product aimed at. Generally the metal is decarbonized immediately after the cinder has been drawn off. In order to hasten the process, however, some works add roll cinder or iron ore in small quantities, determined by the character of the forging test. In order to facilitate this work and at the same time render the cinder sufficiently basic, some works make brick out of roll cinder, with slack lime as a binding material, which are dried near the furnace and added according to the character of the tests of the metal. The additions of manganiferous and silicon materials and the tapping itself possess no peculiarities, the recarbonizing being generally done with spiegeleisen.

In a 7.5-ton charge for rail steel one mill added 100 pounds of spiegeleisen and as much ferromanganese, both pre-heated. About 15 minutes later the tapping began, 150 to 175 pounds of ferrosilicon being added at a red heat in the ladle. Whenever in this establishment steel is made with 0.40 to 0.50 carbon and about 0.30 silicon, about 625 kg. of ferrosilicon are added, partly in the furnace and partly in the ladle before the steel enters it. Another works adds to an 11-ton charge for rails about 1100 pounds spiegeleisen in two sections, one 20 to 30 minutes after melting down of the charge, or about 20 minutes before the tapping, and the other, together with about 45 pounds of ferromanganese directly before the charge is tapped. About 10 to 15 minutes before the tapping an addition of 110 pounds of ferrosilicon is put in. The last operation, carried through simultaneously with the opening of the tap at this works, is stirring the bath with a thick, wooden pole. In Austria and Germany the general practice is to tap into a ladle, while in France this is done directly into the ingot molds. The recarbonizers and the ferromanganese are generally added in a furnace, the ferrosilicon either in the latter or partly in the furnace and partly in the ladle, particularly where large quantities are necessary, as for castings. In that case it is generally risky to make the whole addition in the ladle, because there is some danger that it is not uniformly distributed. Usually no special forging tests are made, on account of the phosphorus.

Senator Quay has introduced a bill appropriating \$25,000 to the Franklin Institute of Philadelphia, for the purpose of determining the quantity of the so-called hammer blow of a locomotive's driving wheel, in accordance with the report of a joint committee of said institute and the American Railway Master Mechanics' Association.

	Carbon.	Silicon.	Phosphorus.	Sulphur.	Copper.	Manganese.
White mill iron.....	3.4@3.8	0.19	0.42	0.07	0.14	1.63
Gray mill iron.....	.....	0.72	0.51	0.04	0.08	2.37
Gray mill iron.....	2.78	1.18	0.43	.....	.....	2.28
Gray mill iron.....	3.10	2.57	0.51	.....	.....	2.71
Thomas pig.....	3.5 @ 4	0.3 @ 0.4	2.7	0.04	.....	0.08
Pig iron, Loire, France.....	3.5	0.3 @ 1.0	0.4	0.05	.....	1 to 3
Pig iron, Loire, France.....	3	0.5	0.07	0.03	.....	2
Low phosphorus, Hungary.....	4	1.5 @ 2	0.08	0.04	0.4	2.5 @ 3.5
Low phosphorus, Hungary.....	3	2.10	0.06	0.015	Trace.	2.74
Schwechat (Styria) coke.....	4.42	1.35	0.11	0.025	.....	4.16
Schwechat (Styria) coke.....	4.05	1.77	0.13	0.017	.....	3.96
Schwechat (Styria) coke.....	3.90	2.11	0.125	0.021	.....	4.56
Hiefau (Styria) coke.....	3.88	0.35	0.06	0.03	.....	2.68
Hiefau (Styria) coke.....	3.48	0.56	0.09	0.03	.....	3.31

charge of pig iron. One mill working the scrap and ore process together adds 5 to 6 per cent. of the latter under ordinary conditions. In some cases the charges are 87.7 per cent. of pig iron and 12.3 per cent. Swedish ore, 5.3 per cent. of limestone, and in the second charge 90.2 per cent. of pig iron, 9.8 per cent. of ore, with a lime addition of 5.7 per cent. Usually the additions of ore are very small, rarely going beyond 100 to 200 pounds, their object being solely to shorten the process toward the end. The limestone is generally employed in the raw state, the quantity ranging between 5 to 8 per cent. When calcined lime is employed the addition is only about one-half.

Two works which have a good deal of their own scrap and a low phosphorus pig, purchasing old rails high in phosphorus, charge as follows: 27 per cent. of pig iron, 44 per cent. of puddle bars, 16 to 20 per cent. of purchased scrap, 13 to 9 per cent. of own scrap and 8 per cent. of limestone, the second using 40 per cent. of pig iron, 16 per cent. of puddle bars, 26 per cent. of purchased and 16 per cent. of own scrap and 5 per cent. of limestone. Both works use but very little or no iron ore. When the change is made from a very soft steel to a harder rail steel the composition of the charge is not changed, the high carbon contents being simply brought about by recarbonizing. The addition of manganese or silicon iron is varied according to the forging test and according to the character of the product desired.

The Process.—In the majority of cases in Germany and Austro-Hungary the entire charge is charged cold and at one time. The working doors are closed, luted and melting down is carried on quietly. Only the ferromanganese and the ferrosilicon are added pre-heated. In France, however, the practice seems preferably to be to charge in several separate lots, and frequently to pre-heat the materials. Usually charging begins with the pig iron or the limestone, a number of extra helpers taking a hand, and in the case

be handled in that way. Many French works also divide their charge into two or more lots, which are melted down one after the other.

When the charge has been made a small dam of basic material is put up before the center door, within which the slag accumulating during the melting is piled up, the door is closed, luted, the gas allowed free access, and the charge is then left to itself to melt down thoroughly.

Handling the Slag.—The bath when just melted always covers over with a thick, porous slag which sometimes threatens to rise above the fire bridge. At some works it is the practice to throw in a few shovelfuls of fluxing material, which, however, must not be added until the iron has been thoroughly melted. Fluorspar is best, its advantageous effect upon the slag being quickly obvious. In the majority of works the next operation consists in tapping the basic slag, generally containing more or less phosphorus. At other works, however, the cinder remains in the furnace until the tapping of the steel, flowing over the ladle or running direct into the pit. When the charge had been made in one lot the slag is generally tapped directly after it has been melted down. If, however, subsequently additions are to be made of materials carrying more or less phosphorus, the tapping of the slag must be delayed on account of additions of lime until the whole charge is in the furnace. It is clear, however, that when the latter additions of iron are low in phosphorus, the slag may be tapped without any danger.

As a general rule, it must be stated that the slag must be drawn off either after the bath has rested a while, after all the phosphoric material has been thoroughly melted and is hot enough to allow cinder and iron to separate thoroughly, or after every addition of phosphoric material. In the latter case suitable quantities of limestone must be added every time after the slag has been drawn off. It is, of course, natural that the lower the bath is in phosphorus the less attention need be paid to

TRADE REPORT.

Chicago.

Office of The Iron Age, 59 Dearborn street, CHICAGO, June 4, 1890.

(By Telegraph.)

This market has been characterized by great activity during the past week. Transactions have been on a large scale, and inquiries keep pouring in from every direction, giving promise of a continuance of the good trade now in progress. The situation has so radically changed that sellers again seem to be on top. Many buyers are anxious to get orders in at old prices, but find it impossible to do so. The improvement is felt most in Sheet Iron, Car Iron and Nails, but Pig Iron is not far behind them.

Pig Iron.—In Pig Iron a heavier business was transacted last week than any week since November. Some of the leading Southern makers of Coke Iron being out of the market, the Northern furnaces have been able to do more business than for a long time without making serious cuts in prices. The largest blocks of Coke Iron sold ranged from 1000 to 7000 tons. Quotations on Southern Coke Irons were advanced 50¢ the past week. The manufacturers now feel confident that this advance can be maintained. Southern No. 1 and 2 Foundry and Mottled are now very scarce. The only grades in good supply are No. 1 Soft and No. 3 Foundry. The Charcoal Iron buyers are in the market in full force. About a dozen of the largest consumers are now asking quotations for their year's supply. This is fully a month in advance of the usual time. Quite a difference of opinion exists in regard to prices. Manufacturers ask from \$20 to \$21, while buyers are bidding \$19 @ \$19.50. The Pig Iron situation, on the whole, looks decidedly reassuring, and it would not be strange if the enormous production of this year should after all only cover the extraordinary requirements of this prosperous country. With so many new furnaces going into blast, however, there is little danger of any wild advance in the price of Iron. Cash quotations are as follows:

Lake Superior Charcoal.....	\$20.00 @ \$21.00
Local Coke Foundry, No. 1.....	16.50 @ 17.00
Local Coke Foundry, No. 2.....	16.00 @ 16.50
Local Coke Foundry, No. 3.....	15.00 @ 15.50
Bay View Scotch.....	17.00 @ 18.00
Am. Scotch (Strong Soft), No. 1.....	19.25 @ 20.00
Jackson County, Soft and Silvery, No. 1.....	17.75 @ 18.25
Southern Coke, No. 1.....	16.00 @ 16.50
Southern Coke, No. 2.....	16.00 @ 16.50
Southern Coke, No. 3.....	15.50 @ 16.00
Southern, No. 1 Soft.....	16.00 @ 16.50
Southern, No. 2 Soft.....	15.00 @ 15.50
Southern Gray Forge.....	15.00 @ 15.50
Southern Mottled.....	14.00 @ 14.50
Tennessee Charcoal, No. 1.....	19.00 @ 19.50
Missouri Charcoal, No. 1.....	18.50 @ 19.00
Alabama Car Wheel.....	20.00 @ 24.00

Bar Iron.—The market is active and higher. Local mills are well filled with orders and not disposed to crowd themselves at present prices. There is opposition to take more business; 1.75¢, half extras, is asked, and it is claimed that with present cost of old material no profit can be realized even then. They will in all probability put their price to 1.80¢ soon. These quotations check business for the time, but if other mills are out of the market consumers cannot help themselves. Youngstown mills ask 1.60¢ at mill for June delivery and 1.65¢ for July and later, subject to delay on account of strikes. Jobbers quote 1.90¢, full extras, for Common Iron, and 2¢ @ 2.10¢ for all Muck Bar.

Structural Iron.—Structural Iron is in very strong demand with most excellent prospects for future business. Contracts are pending on several large structures, and an unusual business prevails in

remodeling old buildings into which Iron and Steel enter in surprising quantities under the new systems of construction. Carload lots, f.o.b. Chicago, are quoted as follows: Angles, 2.25¢; Tees, 2.65¢; Beams, 3.20¢; Universal Plates, 2.45¢; Car Truck Channels, 2.40¢ @ 2.50¢. Beams sell from store in small lots at 3.70¢, but Angles and Tees at 10¢ @ 15¢ @ 100 above carload prices.

Sheet Iron.—Sheet Iron could be sold readily in large quantities if the mills were able or willing to book more orders, but they are now well fixed and are very independent. The last sales reported were made at 2.95¢, mill, for No. 27. Ten cents advance is now asked for deliveries beyond July. Galvanized Iron continues to move very freely, but prices are not so well sustained as for Black Sheets. Jobbers quote small lots of No. 27, Common Black, at 3.30¢, and Juniata Galvanized 65 % off.

Plates, Tubes, &c.—Plate prices continue to stiffen and heavy buyers here are unable to get orders in at the rates named the previous week. Store prices are, therefore, firmer and concessions are being cut off, but no marked advance has yet been made. Tubes are stiffly held, and rumors of cuts are now wanting. The trade of the week has been quite heavy, running mainly small lots from store, but including some to good mill sales. Jobbers quote as follows: Nos. 10 to 14 Iron Sheets, 2.70¢ @ 2.80¢; do., Steel, 3¢ @ 3.75¢; Tank Iron, 2.60¢ @ 2.70¢; Steel, 2.80¢ @ 2.90¢; Shell Steel, 3.25¢; Flange Steel, 3.50¢; Fire Box Steel, 4.50¢; Rivets, 4¢ @ 4.25¢; Norway Rivets, 40 % off; Tubes, one three-quarter and less, 40 % off; two to four and a half, 50 % off; larger, 52½ % off.

Merchant Steel.—Merchant Steel is more active than for several weeks, small orders are more numerous and the hundred ton trade is looking up. Bids are solicited for their season's supply by several large consumers, but the heavy trade generally holds off in the hope that prices may be lower by the time their necessities compel them to lay in stocks. Open Hearth Spring and Toe Calk Steel are quoted at 2.75¢; Crucible Spring, 3.50¢; Open Hearth Machinery, 2.40¢ @ 2.50¢; Bessemer Machinery, 2.25¢ @ 2.40¢; Tire Steel, 2.45¢ @ 2.75¢ rates; Tool Steel, 7¢ and upward, and Crucible Sheets, 7¢, 8¢ and 10¢.

Steel Rails.—In Steel Rails nothing new has transpired. Local sellers quote \$35. Track Fastenings have been active. A large order for Splice Bars was taken at about 1.90¢, and Bolt makers are well sold up, and quote Hexagon firm at 2.90¢. Spikes are quoted at \$2 @ \$2.05.

Old Rails, Wheels, &c.—Old Iron Rails are decidedly higher. Consumers have bid \$23.50 for them without success. Holders want higher prices, and believe they will soon realize their expectations.

Car Wheels.—Have been unusually active. Numerous lots have changed hands at \$19.25 @ \$19.50. Old Steel Rails are worth \$19 @ \$21, according to length and condition.

Scrap.—Scrap Iron is in light supply, and consumers are now looking around for it. Dealers are feeling the market carefully, and are not anxious to run off their stocks at current prices. Quotations are as follows per net ton: No. 1 Railroad Wrought, \$19; No. 1 Forge, \$18.50; Pipes and Flues, \$14; No. 1 Mill, \$15; Cast Borings, \$8.75; Wrought Turnings, \$12; Axle Turnings, \$13; Stove Plate, \$10.50; Mixed Steel, \$14; Coil Steel, \$17.50; Leaf Steel, \$18; Tires, \$19.50; Horseshoes, \$18.50.

Pig Lead.—Pig Lead is expected to be subject to fluctuations until the tariff question is settled; it moves up or down

according to the apparent course of sentiment on the question. Small stocks are said to be held by consumers. Sales last week amounted to some 600 tons at 4.20¢, with 4.25¢ asked on further business.

[Nails and Barbed Wire quotations will be found under head of Hardware.]

Cincinnati.

Office of The Iron Age, Fourth and Main Sta. CINCINNATI, June 4, 1890.

(By Telegraph.)

Pig Iron.—The past week has been the most active one for a long time in the Pig Iron trade of this city. The Southern furnaces continued for a time to meet the demand, although somewhat reluctantly, until they had sold so much that they felt that the time had come when an advance could be maintained. Prices have been put up 50¢ @ ton for present and easily future delivery, and \$1 @ ton for delivery beyond September. Most of the sales for the week were on the basis of old rates, but enough has been done at the higher prices to establish the advance on Southern Coke No. 1, No. 2 and No. 3, and Gray Forge and Mottled Coke Irons. Pipe works have been the largest purchasers, but nearly all consuming interests were represented in the sales which make the aggregate volume of business about 75,000 tons. Among the most notable sales during the week were 4400 tons Silver Gray and Forge at \$13 and \$14, Cincinnati; 9200 tons in Soft No. 2, Gray Forge and No. 3 at \$13.25, \$13.50 and \$13.75, Cincinnati; 3000 tons ditto at \$10.50, \$10.75 and \$11, at furnace; 2000 tons Car Wheel at \$22, Cincinnati; 16,000 tons, prices not made public, and 12,000 tons and 1500 tons on the new basis of prices. The whole market has naturally an undertone of confidence as the result of the week's business. Matthew Addy & Co. have been appointed agents for the sale of the Williamson Furnace, of the Birmingham, Ala., district. The Pioneer Company intend to erect two more stacks at Thomas, Ala. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$15.00 @ \$15.25
Southern Coke, No. 2.....	14.75 @ 15.00
Southern Coke, No. 3.....	14.00 @ 14.50
Ohio Soft Stone Coal, No. 1.....	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2.....	15.50 @ 16.00
Maboning and Shenando Valley.....	16.50 @ 17.00
Hanging Rock Charcoal, No. 1.....	20.00 @ 21.00
Hanging Rock Charcoal, No. 2.....	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1.....	17.20 @ 18.50
Tennessee and Alabama Charcoal, No. 2.....	18.00 @ 18.50

Forge.

Gray Forge.....	13.75 @ 14.00
Mottled Neutral Coke.....	13.25 @ 13.50

Car Wheel and Malleable Irons.

Southern Car Wheel.....	22.50 @ 23.25
Hanging Rock, Cold Blast.....	21.50 @ 24.25
Lake Superior Car Wheel and Malleable.....	20.00 @ 21.00

Detroit.

WILLIAM F. JARVIS & Co., under date of June 2, 1890, say: Nearly every grade of Pig Iron continues to show increased firmness. As anticipated in our last report, there were a number of large sales of Lake Superior Charcoal, aggregating several thousand tons, but notwithstanding this, there is still left unsatisfied to-day a larger inquiry than at any time during the year, and no doubt the present week will show more business than the one just passed. Prices are firm, and concessions will not be made by the furnacemen. Decidedly the advantages are inclined toward the sellers. What is reported above for Lake Superior Charcoal Iron may also be said to apply to Southern Foundry and Forge Irons, although the volume of business was not as large, only foundry grades

having been needed. All sellers are sanguine of a continued better market. We should place the figures now at:

Lake Superior Charcoal, all numbers.....	\$20.75 @ \$21.25
Lake Superior Coke, Bessemer.....	19.00 @ 20.00
Katahdin (Maine Charcoal).....	24.00 @ 25.00
Lake Superior Coke Foundry, all ore.....	19.25 @ 19.75
Southern No. 1.....	16.75 @ 17.25
Southern Gray Forge.....	14.75 @ 15.00
Jackson County (Ohio) Silvery....	18.50 @ 19.00

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., June 3, 1890.

After a period of protracted weakness, the Iron market is developing an advancing tendency, and it begins to look as though the last half of the year would be of a similar character to that of 1889. There is firmness everywhere and weakness nowhere, so that the outlook is unusually favorable. The demand is good and stocks are low, so that with a very moderate increase in consumption prices would be likely to harden along the entire line. So far as we can learn all the large consuming interests are in excellent condition. Most of them are running well up to their fullest capacity, while the prospect for the balance of the year is full of encouragement. Prices are not materially higher than they were at this date a year ago, but the cost of production is considerably more, so that it will require some advance in selling prices to place manufacturers in as favorable a position as they were at the time named. Matters are shaping very satisfactorily, however, and it may be said that the general conditions are probably better than they have been for a long time past.

Pig Iron.—Prices are unchanged but firm. There is very little iron to be had at less than \$15.50 @ \$16, delivered, for good mill irons, \$17 for No. 2 Foundry, and \$18 @ \$18.50 for No. 1. But the demand is not large, consumers being inclined to feel their way along, rather than pay the advance which the majority of sellers are inclined to ask for full deliveries. For prompt delivery, and strictly cash payment, some irons can be had at 50¢ @ \$1 below the figures we have named, but they are not "going a begging" by any means, as there is a good deal of confidence in the ultimate outcome. Nevertheless cash buyers are liberally dealt with. The tendency of the market, however, is towards conservatism on both sides, neither one feeling particularly anxious to discount the future. The result is a hand to mouth business at steady prices, demand being in about equal proportion to the supply. Advice from the West indicate a very strong feeling in that direction, with some tendency toward a "small sized boom." Eastern markets will doubtless follow any legitimate improvement, but they are no more disposed to inflation than they were a year ago; hence while there is a good deal of confidence in better prices ultimately, they are not likely to be adopted prematurely. This, in a large measure, accounts for the comparative dullness in Eastern markets which, however, is more in appearance than in fact, as it is uniformity rather than dullness, each week and each month furnishing an enormous demand in the aggregate, instead of bunching three or six months business within the space of perhaps only that many weeks, to be followed by a long period of inactivity and more or less weakness in prices.

Bessemer Pig.—No sales of any magnitude have been reported in this vicinity, although consumers are making inquiries with a view to early purchases. Holders are firmer in their views, and quote \$20.50 @ \$21 at furnace, with somewhat loose restrictions as to quantity and dates

for delivery. A good deal of confidence is expressed in regard to the ultimate course of the market, as the demand bids fair to exceed the supply, which is already taken up for the next three or four months.

Charcoal Iron.—There is more inquiry, and some sales at prices ranging from \$21.50 to \$23, delivered, for Hot Blast, and \$26 @ \$27.50 for Cold Blast. Prices regulated by quantity, brand and time and place for delivery.

Spiegeleisen.—Holders quote a full dollar advance, but without attracting any corresponding movement on the part of the buyers. There are sellers at \$31.50 @ \$32 for 20 % at Atlantic ports, duty paid, but buyers talk \$30 @ \$30.50, and for the present decline to advance their bids.

Ferromanganese.—Nothing doing of any importance. There are sellers of 80 % at from \$78 to \$80, duty, paid at Atlantic ports, with small lots taken at the figures named.

Steel Rails.—There is considerable inquiry, but without any quotable change in prices. Manufacturers are inclined to ask a little more money, on account of the increased cost in material, but desirable orders would doubtless be taken at \$31.50 @ \$32 at mill, providing firm offers were made.

Steel Billets.—It is difficult to give exact quotations, as most of the leading mills have their capacity fully engaged until the 1st of August. For delivery, during June and July, limited quantities are offered at \$32.50 @ \$33, delivered, but many mills refuse to quote until things are more settled.

Muck Bars.—There has been considerable inquiry for Bars at last week's prices, but manufacturers now quote \$28 @ \$28.50 at mill, with no disposition to make concessions from these figures. Buyers could be found for large lots at 50¢ less money, but so far as we can learn there is nothing in the market for less than the figures above named.

Bar Iron.—There is no material change from last week; the demand is fair but barely sufficient to keep the mills going, so that prices remain about as they have been for some time past. These vary according to quantity, specification of sizes, delivery, &c., but as a rule 1.82¢ @ 1.85¢, delivered, may be considered full average prices. Special qualities command 1.90¢, while on 100 ton lots and upward some of the country mills have quoted as low as 1.77¢ @ 1.80¢, but the average is, as we have stated, 1.82¢ @ 1.85¢ for strictly good Iron.

Skelp Iron.—The market has been extremely dull and sales have been recently made at prices as low as anything on record. The asking prices to-day, however, are 1.75¢, delivered, for grooved skelp and 1.95¢ to 2.0¢ for sheared, with a good demand. Sales to-day amount to about 2500 tons, at figures named.

Plates.—There is a fair run of miscellaneous orders, but nothing heavy has been on the market recently. Mills are fairly employed but competition is sharp, making it almost impossible to run full, unless at low prices. The consequence is that no one feels confident enough to ask an advance, therefore last week's figures are repeated, subject to delivery in consumers' yards and possibly a little shading on the best class of orders.

	Iron.	Steel.
Ship Plates.....	2.05 @ 2.10¢	2.35 @ 2.35¢
Tank.....	2.10 @ 2.15¢	2.30 @ 2.40¢
Bridge Plate.....	2.10 @ 2.15¢	2.30 @ 2.40¢
Shell.....	2.40 @ 2.50¢	2.50 @ 2.60¢
Flange.....	3.00 @ 3.15¢	2.80 @ 3.00¢
Fire-Box.....	3.75¢	3.75 @ 4.25¢

Structural Material.—There is very little change to note in this department. Mills are running pretty full and appear to secure all the orders they can handle

at figures recently ruling. The outlook for the balance of the year is considered very favorable, so that prices are maintained as follows: 2.20¢ @ 2.25¢, delivered, for Sheared Plates; 2.15¢ @ 2.20¢ for Angles, with 10¢ @ 15¢ more for the same in Steel. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—There is a good demand for Sheets, and the best makes are firmly held at quotations recently ruling. Large buyers, however, have succeeded in obtaining concessions, but quotations for small lots remain as follows:

Best Refined, Nos. 14 to 20.....	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24.....	3.20¢ @ 3.30¢
Best Refined, Nos. 25 to 26.....	3.40¢ @ 3.50¢
Best Refined, No. 27.....	3.50¢ @ 3.60¢
Best Refined, No. 28.....	3.60¢ @ 3.70¢
Common, % less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3.1¢ @ 3.1¢
Best Soft Steel, Nos. 21 to 24.....	3.3¢ @ 3.3¢
Best Soft Steel, Nos. 25 to 26.....	3.5¢ @ 3.5¢
Best Soft Steel, No. 27.....	3.6¢ @ 3.6¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	

Best Bloom, Galvanized, discount.....	60 %
Common, discount.....	62½ %

Old Rails.—There is an active demand for Rails at prices ranging from \$24.50 to \$25, delivered at mills in the interior. The offerings are very light, however, and buyers find it a difficult matter to place their orders at figures named. Nothing doing on the seaboard, but \$24 would be promptly bid for desirable lots.

Scrap Iron.—There is a better demand and prices are firm, without being quotably higher. Sales at about the following prices: No. 1 Wrought, \$21.50 @ \$22 Philadelphia, or for deliveries at mills in the interior, \$22 @ \$23; \$16 @ \$17 for best Machinery Scrap, \$15 @ \$15.50 for ordinary, \$16 @ \$17 for Wrought Turnings, \$11 @ \$11.50 for Cast Borings, and \$25 @ \$27 for Old Fish Plates, and \$17 @ \$18 for Old Car Wheels.

Wrought Iron Pipe.—The demand is very satisfactory and with an increasing tendency. Trade is considered equally as good, if not better, than at the same season last year. Discounts unchanged, as follows: Butt-Welded Black, 47½ %; Butt-Welded Galvanized, 40 %; Lap-Welded Galvanized, 47½ %; Lap-Welded Black, 60 %; Boiler Tubes, 1½ inches and smaller, 45 %; Boiler Tubes, 2 to 4 inches, 50 %; Boiler Tubes, 4½ inches and larger, 52½ %; Oil Well Casing, 50 %.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, June 2, 1890.

Pig Iron.—The feeling among producers is very much improved since the last report from this quarter. Quite a significant feature of the market is that there is less Iron in stock in the furnace yards than a month ago; in other words, there is very little now available for immediate shipment. The demand is much improved, and there is a greatly increased amount of inquiry. The furnaces are selling for deliveries only in the near future, as they are quite firm in their belief that prices will be better within the next 60 or 90 days. Large amounts of Iron could be contracted for at \$12.50 at the furnace, but as a general thing they are not selling for this, or if they do, it is for current make, as they can spare it. Your suggestion about Iron in your last number is not new among many of the furnaces, as the question of banking their stacks from two to four weeks has been discussed among our Southern furnaces to a considerable extent during the last two weeks. It is considered entirely practical by those who have been heard from, and a concerted action is only wanting to test its practicability. So far as is known there are no stacks in the South that could not bank from two to four weeks without incon-

venience, and the discussion of this question has already caused a stiffness in the market, by increased inquiries for immediate shipment. Of course, should this be done, the furnaces would be obliged to protect sales already made, which has caused a reluctance on the part of many of the stacks to make contracts that would interfere with such arrangement. On the whole, the condition of the market is considerably improved, and the outlook is that this improvement will continue for some weeks ahead.

Birmingham.

BIRMINGHAM, ALA., June 2, 1890.

Pig Iron.—There has been a spasmodic revival of the Iron trade this week, and orders have been pouring in much to the surprise of the furnace men. True, the orders have been small, but they have been numerous and most of them for immediate shipment. The largest sales were made by the Tennessee Coal, Iron and Railroad Company from their Emsley City furnaces. They sold last week 18,000 tons of Nos. 1 and 2 Foundry Iron, all for June delivery. This is regarded as extraordinary for one week's business at this season of the year, and it is especially so at this time on account of the general dullness. The sales by the Tennessee Company were all made in Western markets, and the largest order was for 4000 tons. Other furnaces in the district have also received numerous small orders during the week, and more than half the Iron that can be made this month is already sold. The sudden rush of orders caught the railroads unprepared for the extra business, and a scarcity of cars has delayed several shipments. There is no material change in prices, No. 1 Foundry being held firm at \$12.50, cash, f.o.b. at furnaces, and No. 2 at \$11.50 @ \$11.75. The weekly output of this district is about 15,000 tons, all the furnaces being in blast.

Cleveland.

CLEVELAND, June 2, 1890.

Iron Ore.—The Ore men are still devoting the greater share of their attention to the question of freights. They have succeeded during the past week in making 85¢ the established rate from Escanaba to Lake Erie ports, and it is generally believed that several charters have been made at 82½¢. The Marquette rate has dropped to \$1.10, and the Ashland rate to \$1.20 for single charters. The market appears to have been strengthened all around by the encouraging reports from all the great Iron centers. The sales reported have been at the full quotations prevailing during the winter and early spring. From 10,000 to 18,000 tons of new Ore are being unloaded on the Cleveland docks every 24 hours.

Pig Iron.—The improvement in the market has been gratifying. Sales of Bessemer and Mill Irons have not only increased, but there has been decided advances in prices. Bessemer Iron is now held at \$19.30 @ \$19.80, and for an order for delivery several weeks in the future the latter figure would be refused. With the uncertainties existing everywhere it is difficult to give reliable quotations, but there is a firmer feeling everywhere and prices for all grades of Iron have a strong upward tendency. Quotations to-day are at least no longer than the following figures indicate:

Nos. 1 to 6 Lake Superior Charcoal	\$21.00 @ \$22.00
Nos. 1, 2 and 3 Bessemer	19.30 @ 19.80
No. 1 Strong Foundry	17.80 @ 18.30
No. 2 Strong Foundry	16.80 @ 17.30
No. 1 American Scotch	17.80 @ 18.30
No. 2 American Scotch	16.80 @ 17.30
No. 1 Soft Silvery	17.50 @ 18.50
Mahoning and Shenango Valley Neutral Mill Irons	15.80 @ 16.30
Mahoning and Shenango Valley Red Short Mill	16.30 @ 16.80

Old Rails.—In harmony with the conditions existing in other branches of the trade, the market for Old American Rails shows an improvement both in demand and in prices. Sales are reported at \$23.50 @ \$24, and there are rumors of still further advances.

(By Telegraph.)

The Pig Iron market continues to improve. Bessemer and Foundry Irons are selling quite freely at slightly better prices than were paid last week. There is also a good demand for Mill Iron. Additional sales of Non-Bessemer Ore at \$4.50, f.o.b. vessels, Cleveland, are reported.

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st.,
ST. LOUIS, June 2, 1890.

Pig Iron.—The buying of small lots continues, and prices reported firmer than two weeks ago. There has been considerable inquiry from large consumers for good round lots of iron for delivery extending through the rest of the year, but furnacemen do not care to accept an order except for quick delivery—that is, within the next month or two. A number of furnaces are sold ahead on certain grades of iron, and have withdrawn their prices on these grades, consequently there is something of a scarcity, which, however, will be only temporary, unless the demand increases much more rapidly than the present condition of affairs seems to warrant. The improvement in Eastern markets has had a beneficial effect on local trade, and buyers who were waiting the customary slump in June are now in the market for supplies. It is difficult to determine whether the improvement has come to stay or is merely a temporary spurt. To look at it from the consumer's view, there is every reason to expect a gradually improving market, as all classes of manufacturers are busy, stove works, machine shops, architectural foundries, &c., have all the work they can attend to, and it would not be surprising to see a steadily improving market from this time on. No. 1 Foundry is quoted at from \$15.75 to \$16, and it is doubtful if the lowest price named could be shaded to any extent. We quote as follows, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry	\$15.75 @ \$16.00
Southern Coke, No. 2 Foundry	14.75 @ 15.00
Southern Coke, No. 3 Foundry	14.25 @ 14.50
Gray Forge	13.75 @ 14.00
Southern Charcoal, No. 1 Foundry	18.00 @ 18.50
Southern Charcoal, No. 2 Foundry	17.50 @ 18.00
Missouri Charcoal, No. 1 Foundry	18.00 @ 18.50
Missouri Charcoal, No. 2 Foundry	17.25 @ 17.75
Ohio Softeners	18.50 @ 19.50

Connellsville Coke, f.o.b. East St. Louis, \$5.65; St. Louis, \$5.80.

Bar Iron.—A steady increase in the volume of business is reported at full prices. The mills whose prices have been upsetting the market have filled their order books, and with one or two exceptions are out of the market, at least will not accept orders for immediate delivery. The mills who have been holding their product at outside prices are even more firm in their views, and an improving market is the result. Lots from store command 2¢, while mills quote from 1.80¢ to 1.85¢.

Barb Wire.—Some little improvement is noticeable in this department as regards prices. The bulk of the low priced Wire has been placed, and on account of the recent advance in raw material mills are not disposed to accept the low prices that have been ruling. The volume of business is large and increasing. We quote as fol-

lows: Painted, 2.85¢ @ 2.95¢. Galvanized, 3.45¢ @ 3.55¢. Carload lots 10¢ @ cwt. less than above prices.

(By Telegraph.)

The Pig Iron market continues to gain in firmness, while the demand is improving daily. No. 1 Southern Foundry is quoted at \$15.25, f.o.b. St. Louis, for delivery no later than August, and 50¢ additional is asked for shipments beyond that time. A sale of 4000 tons No. 3 Foundry and 3000 tons No. 3 Soft was made a few days since at private terms. The demand for Barb Wire is increasing and prices show some signs of early improvement.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building,
PITTSBURGH, June 3, 1890.

Pig Iron.—The activity noted in our report of a week ago continues and but for the extreme views of furnacemen, the volume of business would have been greater. Producers are impressed with the belief that prices will go still higher, and this accounts for their discrimination to sell, while the same feeling makes consumers anxious to buy. Mill owners are anxious to buy now at from 50 to 75¢ per ton more than it was offered to them a few weeks ago. Some of the brokers who are not doing much give as a reason therefore that the furnaces they represent are holding back for better prices; they could sell if they had the Iron to meet the market with. Thus far there has been little or no speculation developed; the demand comes almost entirely from consumers and the market is in a perfectly healthy condition. We quote prices as follows:

Neutral Gray Forge	\$15.25 @ \$15.50, cash.
All Ore Mill	16.25 @ 16.50, "
No. 1 Foundry	17.75 @ 18.00, "
No. 2 Foundry	17.00 @ 17.25, "
No. 1 Charcoal Foundry	23.50 @ 24.00, "
No. 2 Charcoal Foundry	21.50 @ 22.00, "
Cold Blast Charcoal	25.00 @ 30.00, "
Bessemer Iron	19.00 @ 19.50, "

Sales of several thousand tons of Mill Iron were reported at \$15.25 @ \$15.50, cash, and while there were no sales of Bessemer reported above \$18.75 @ \$19, cash, it would be difficult at the present writing to find a seller beyond this or next month under \$19.25 @ \$19.50.

Muck Bar.—Considerable business during the past week, and sales of some 2000 tons reported at \$28, cash. It is claimed that some sales have been made within the past two days at \$28.25 @ \$28.50.

Manganese.—Small sales of 80 % Domestic Ferro reported at \$82 @ \$83, Pittsburgh. We are also advised of some 1800 tons of 80 % Foreign at \$90, New York. There has been a considerably increased demand of late.

Manufactured Iron.—There is an increasing demand reported for nearly all kinds of finished Iron, and prices, although unchanged, are firmer in sympathy with the raw material. A good many manufacturers are not disposed to contract for future delivery at present prices. We continue to quote Bars at 1.75¢ @ 1.85¢; Plate and Tank Iron, 2.15¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢; Skelp Iron, 1.75¢ @ 1.80¢ for Grooved, and 2.05¢ @ 2.10¢ for Sheared; all 60 days, 2¢ off for cash.

Cut and Wire Nails.—Nothing of an important character developed here during the week; business continues light, so far as the Cut Nail trade is concerned. The price here remains unchanged at \$1.90, 60 days, 2¢ off for cash, but nearly all the Nails being sold in this market now are brought from Wheeling and Ironton and other points west of here, where the price is very much

lower than it is here. Wheeling has advanced the price to \$1.70, and a meeting has been called there in a few days, and it is expected that the price will be pushed up still higher. Advices from the Wheeling district report that there has been quite an active demand there for Nails during the week; one firm there is reported as having turned away orders within the past few days for some 18,000 kegs. There is an increasing demand for Wire Nails, which may be quoted at \$2.25 in carload lots and \$2.35 in a small way, 60 days, 3 % off for cash.

Structural Iron.—There is an increasing inquiry, and while prices remain unchanged there is a firmer feeling, in sympathy with raw material. Angles, 2.25¢; Channels and Beams, 3.10¢; Sheared Steel Bridge Plates, 2.75¢; Universal Mill Plates, 2.40¢; Refined Bars, 1.90¢ @ 2¢.

Steel Plates.—The demand is reported fair, prices firmer but unchanged. Fire-Box, 4½¢ @ 4½¢; Shell, 3¢; Flange, 3.15¢ @ 3.20¢; Tank, 2.75¢.

Merchant Steel.—There is nothing new reported; business fair, prices unchanged. Tool Steel, 8¢ and upward; Crucible Spring Steel, 4¢; Open Hearth Steel, base sizes, 2½¢; Bessemer Machinery Steel, 2.35¢; Tire Steel, 2.50¢ @ 2.60¢.

Wire Rods.—There is more inquiry, and the market is firmer; quoted at \$41.50 @ \$42.50 gross ton, as to character of order and delivery.

Billets and Slabs.—The firmness which has characterized the market for Bessemer Steel Billets and Slabs for some weeks past continues, and prices are still on the up grade. We now quote at \$29.50 @ \$30, and a sale of 1000 tons of Billets was reported for July at \$31. As compared with the lowest point there has been an advance of from \$3.50 to \$4 gross ton.

Wrought Iron Pipe.—There is a continued good degree of activity, and the outlook for the rest of the year is regarded as very encouraging. No change in prices. Discounts on Black Butt Weld Pipe, 47½¢; on Galvanized do., 40¢; on Black Lap Weld, 60¢; on Galvanized do., 47½¢; Boiler Tubes—1½-inch and smaller, 45¢ off; 2 to 4-inch, 50¢; larger than 4-inch, 52½¢; Casing, all sizes, 50¢ off.

Old Rails.—Considerable inquiry for Old Iron Rails the past week and with scant offerings; the market is strong and prices have gone still higher. We now quote at \$25.50 @ 26, with a sale of 700 tons to a city consumer at \$25.50. Consumers in the Mahoning and Shenango Valleys are almost bare and there is a good deal of inquiry from the localities noted. Brokers who make a specialty of Old Rails report that they are very scarce and hard to get, and those having any are indifferent about selling, being impressed with the belief that prices will go still higher. There is also considerable inquiry for Old Steel Rails, and they, too, are scarce and hard to get, and the market is firm in consequence in the absence of sales.

Railway Track Supplies.—Dilworth, Porter & Co. continue to report a very light demand for Spikes for this season of the year, but they are hopeful of an improvement later on; no change in price, 2.05¢, 30 days, on cars here, and 2.15¢, delivered at Chicago and St. Louis. Iron Splice Bars, 1.80¢ @ 1.90¢. Splice Bars, 1.95¢ @ 2.05¢; Iron Track Bolts, 2.85¢, with Square and 3¢ with Hexagon Nuts.

Steel Rails.—There has been little done here the past week, while prices remain unchanged. There is a firmer feeling in view of the recent sharp advance in Bessemer Pig, and the mills not only here, but throughout the country are pretty well sold up. We continue to quote at \$31 @ \$32, on cars at works, with a sale of 2500 tons reported at \$31.50; for small

lots for immediate delivery better prices than those quoted are being obtained. The Allegheny Bessemer Company turned out 15,000 tons of Rails last month—a pretty good month's work. The company expect to do still better.

Old Material.—There is a fair business and prices are firmer, but without quotable change. Sales: No. 1 Wrought at \$20 @ \$20.50, net ton; Cast Scrap, \$15, gross; Old Car Wheels, \$18.50 @ \$19. Steel Bloom Ends may be quoted at \$21, gross ton, with considerable inquiry and but few offering.

(By Telegraph.)

Bessemer Pig continues strong with considerable inquiry. Sales 2000 tons for July and August at \$19 cash, many furnacemen asking 50¢ to \$1 more. Forge Irons firm, but no sales as yet reported above \$15.50 cash; consumers generally not so anxious to buy ahead. It is thought the wage scale will be settled without trouble, but still there is an uncertainty. Muck Bar is more active and higher; sales reported at \$28.50 @ \$29, cash. Bessemer Steel Billets quoted firm at \$30 @ \$31, according to delivery. Old Iron Rails continues scarce, with considerable inquiry, and higher prices are looked for. Late advices from the Mahoning and Shenango valleys report furnacemen as having their ideas away up.

New York.

Office of The Iron Age, 65 and 68 Duane street, New York, June 4, 1890.

The happenings of the past few months have emphasized more strikingly than ever before how the leadership in the markets which the East once possessed has been resigned to the leading cities West of the Alleghany Mountains. Every important impulse has come from Pittsburgh, Cincinnati or Chicago, in the lines in which they are respectively the leading markets. It is useless to disguise the fact that the East has finally and completely lost its supremacy.

American Pig.—The New York market is very quiet, transactions, with few exceptions, being on a moderate scale, with prices practically unchanged. The buoyant reports from other centers are reflected by a more hopeful feeling, which has not, however, found expression in a larger volume of business or higher figures. The action of the Thomas Iron Company in marking the price of No. 1 Foundry down to \$18 is without any significance whatever, the market having been at that figure for a long time. It merely means that those who are under contract will have their Iron billed at a lower figure. Some of the Southern furnaces have practically withdrawn from this market. The Eastern Malleable Iron works are in the market now for about 13,000 tons of Charcoal Iron, and about 6000 tons of Charcoal Iron are included in the tenders just issued by the Grand Trunk Railroad. An equal quantity of other grades of Pig Iron is required, but will probably be taken by English makers. We quote Northern No. 1 Foundry \$18 @ 18.50; No. 2 \$17 @ \$17.50; Southern No. 1 \$16.75 @ 17.25; and No. 2, \$16 @ \$16.50.

Spiegeleisen and Ferromanganese.—The only transaction of any magnitude closed during the week was the sale of a 2000-ton lot of 20 % Spiegeleisen, special brand, for future delivery to a Pittsburgh Rail mill at private terms. We quote \$31.50 @ \$32 for tidewater delivery. There have been some sales of Ferromanganese, prices ranging between \$76 @ \$78 for future delivery. The largest order, of

600 tons, for a Pittsburgh mill was taken by the producer in that locality at private terms, but reported to be equal to the current selling price of Foreign at tidewater.

Billets.—The movement has been light in the East, the few sellers apparently awaiting developments in the West. For a block of 5000 tons \$30, at mill, was refused. In Slabs extended inquiry by a Nail mill for a round lot for delivery during the second half of this year brought out only one offer of \$31.25 at seller's mill.

Wire Rods.—Only small sales are reported, the current quotation being \$43 at seller's mill.

Steel Rails.—Reports are conflicting, but it is apparent that with those who take a very hopeful view the wish is father to the thought. Sales have been on a larger scale, Eastern mills taking in the aggregate about 25,000 to 30,000 tons, the bulk thereof for Southern roads. The total includes one large block which was reported closed months since, but has apparently been finally arranged for now. Among the sales is one in territory usually considered tributary to Pittsburgh. Some of the Eastern mills are eager to secure orders, and, taking it as a whole, excepting possibly the two Pittsburgh works, the mills are competing sharply for what orders come into the market East, South or West. Occasionally one or the other, having put the order book into better shape by very active competition, quotes higher prices, but others seem ready to step in to bid for their share at close figures. During the current year there has been some selling, with a guarantee to the purchaser against a decline, the price being that current at the time of the delivery of the monthly proportion of the cut rate. We quote: \$30.50 @ \$31.50, at Eastern mill.

Structural Material.—Quite a number of large buildings are coming into the market, among them a brewery and a large hotel. We quote: 2.15¢ @ 2.20¢ for Plates, 2.15¢ @ 2.25¢ for Angles, 2.5¢ @ 2.6¢ for Tees and 3.1¢ for Beams and Channels.

Fastenings.—We quote Spikes \$2.00 @ \$2.10, Angle Bars 1.75¢ @ 1.80¢ and Bolts and Nuts 2.80¢ @ 3¢.

Old Rails.—There is a widespread inquiry, and with the simultaneous appearance of a considerable number of buyers East and West the market has stiffened. Sales aggregate about 1500 tons here, and at least one order for a lot of 1000 tons of Foreign Rails for shipment has gone abroad. As much as \$24 and even \$24.50 has been offered for Rails in quantity up to 5000 tons. The supply of Flange Rails in this market is estimated at 3500 tons, while the stock of Double Heads is a little over 4000 tons, all held in strong hands.

Financial.

Commercial affairs during the week showed little animation, partly due to holiday interruptions. Although the money situation is easier, the issue of the silver question remains as much in doubt as ever, and opinions are still at variance respecting the final outcome of tariff legislation. Railroad movements command much attention, chiefly in regard to adjusting of rates between the seaboard and the West, especially while the lake routes are a disturbing factor. At the same time the persistent efforts of the Canadian Pacific to obtain a larger share of American trade—at last actually absorbing the "Soo line," with which it has had traffic arrangements with its own system—are likely to accentuate the movements in Congress bearing on the case. In the merchandise markets prices are hardly as strong as about a week

ago. Spot cotton is slow at $\frac{1}{8}$ ¢ decline. Spot wheat is irregular. Corn is firm, with a fair export business. Coffee is strong and active. Petroleum quiet. Sugar is in good demand and stronger. Ocean steam carriers have some attention for grain. Among dry goods jobbers cotton fabrics were in demand with higher prices for several descriptions. Some of the mills have been obliged to buy the raw material at $12\frac{1}{2}$ ¢ $\frac{1}{2}$ lb and over, or about 33 % advance, compared with the beginning of the cotton year. Provisions have been on the downward turn. The clearings of 51 cities last week show an increase of 4 %. New York decreased 1.5 %. Crop reports throughout the South are favorable, but in the wheat district reports are conflicting.

In the stock market the appointment of George R. Davis, of Chicago, as receiver for the Chicago Gas Trust, made still more pronounced the reaction from the period of inflation that followed the announcement of an agreement in Congress on the silver question. All the trusts sold off heavily. Then came an attack on Oregon Transcontinental and other Western railways, including St. Paul, Atchison and Rock Island. The downward tendency was counteracted by a measure of success among railroad officials in their endeavor to adjust long existing differences. The Trunk line joint committee, however, to whom the subject was referred, failed to agree upon a restoration of Eastbound all rail rates between Chicago and the seaboard, and further action is awaited with anxiety. Previous to the Trunk line meeting above noted, all the Western and Northwestern roads had signed an agreement for the restoration of rates June 10, with the tacit understanding, as supposed, that the entire programme would be carried out. The market at the close is slow and unsatisfactory, with interest chiefly concentrated in the trusts. The transactions on the New York Stock Exchange last month aggregated 10,201,829 shares of stock, an increase upon last year's figures of 2,924,731 shares. On Tuesday word was received from the Clerk of the Court of Appeals that there can be no decision handed down in the case of the North River Sugar Refinery before June 10. In reference to the Chicago Gas Trust it is now understood that the recent decision merely substitutes Receiver Davis for the Fidelity Trust Company, of Philadelphia, which has been the custodian of the stock.

United States bonds are quoted as follows:

U. S. 4½, 1891, registered.....	102½
U. S. 4½, 1891, coupon.....	102½
U. S. 4½, 1907, registered.....	121
U. S. 4½, 1907, coupon.....	122
U. S. currency 6s. 1895.....	119½

In bank stocks, 50 shares Bank State of New York sold at 115, 10 shares of Bank of New York at 250, 10 shares of Merchants' at 163, and 40 shares Western National at 106½.

The bank return for the week shows an increase of \$1,440,825 in surplus reserve, which now stands at \$4,912,125. Loans were contracted to \$2,613,800; legal tenders increased \$1,186,700; deposits decreased \$1,272,900. In the money market rates tended to a lower basis and commercial paper was in better demand. Rates were 5 % @ 6 % on good collateral and prime single names 6 % @ 7 %. Interest and dividend disbursements for the current month are estimated at \$35,000,000. It is announced that the Louisville and Nashville will issue a blanket mortgage 4 % loan to cover outstanding issues and for the purpose of getting funds for improvements and betterment. Negotiations are in progress for the absorption by the Canadian Pacific of the Soo line, which runs from Sault Ste. Marie westward to St. Paul, a distance of 494 miles, and thence

300 miles further west to Boynton, Dak. The alliance already in force is one by which traffic is taken from the Canadian Pacific at Sault Ste. Marie and delivered to Wisconsin and Minnesota points. The quarterly statement of the National banks of the city of New York shows that their loans and discounts May 17 were \$9,645,300 less than on February 28.

The monthly public debt statement shows a decrease of \$6,661,871 during the past month of May, and for the eleven months of the current fiscal year, \$67,787,722. The total debt, less cash in the Treasury, on the 1st of June, was \$1,008,858,998. The gold fund balance increased about five millions during the past month, and amounts to \$190,544,854. The fund of standard silver dollars keeps steadily increasing, and the Treasury now holds \$309,988,092 of this coin. Government receipts for the present month will probably reach \$35,000,000, swelling the total for the current fiscal year very close to \$400,000,000, or \$15,000,000 more than Secretary Windom's estimate made early last fall. On the other hand, expenditures during eleven months aggregate \$303,124,940, or about \$14,000,000 more than for the corresponding eleven months of the past fiscal year.

Silver Bullion declined in price to 101½, this despite the fact that the price in London was relatively higher than in New York.

The posted sales for Sterling are 4.85¢ @ 4.87¢.

A German-American oil company has been founded at Bremen in connection with the Standard Oil Company, with a capital of £450,000. The object of the organization is to own and run tank steamers for the transportation of American petroleum to Germany, and to store and distribute the petroleum on the Continent.

At the annual election of the Produce Exchange officers were elected as follows: President, Evan Thomas; vice-president, Thomas P. White; treasurer, E. C. Rice. The Cotton Exchange elected these officers: President, C. W. Ide; vice-president, J. C. Bloss; treasurer, Walter T. Miller. Stewart L. Woodford, of New York, and Thos. S. Johnson, of Huntingdon, Pa., were appointed receivers of the Huntingdon Mfg. Company, who manufactured cars for the Iron Car Company, of New York.

Imports of merchandise at this port for the week were \$9,674,000; exports, \$4,938,000.

Metal Market.

Copper.—Lake Superior product has remained very firm, although trade has been quieter. Ingot may possibly be obtained in moderate quantities at 15½¢, but neither the mining companies nor large outside holders are offering less than 15½¢ for either prompt or future delivery. Consumers seem to be well supplied, and are indifferent buyers at the present time. Wire Bars, it is stated, can be purchased at very little, if anything, under 16¢. For metal in this form there is still a good demand, and the mining companies have orders so far ahead of their production that they are disinclined to enter additional contracts with ordinary guarantee as to delivery. Arizona Ingot remains very firm at 14¢, and 13½¢ @ 13¼¢ are close prices for common casting brands. The demand for these varieties is hardly as brisk as it was a week ago. Merchant Bars sold off a fraction in the London market, but since recovered.

Tin.—Under the influence of a decline of about £1.5/ in London prices for Pig Tin dropped about ½¢ in this market. Just prior to the decline heavy transactions were reported in London, and 350 to 400 tons changed hands here in a speculative

way. From that time until Tuesday, however, interest lagged, when a few trades were effected at 21¢ for June, and 20.90¢ for July. Wednesday showed a stronger market, with 21.15¢ net cash quoted for 10-ton lots; 21½¢ regular for 5-ton lots from store, and 21¼¢ @ 21½¢ for jobbing quantities. Statistics posted on the Metal Exchange show a visible supply June 1 of 13,056 tons, or 359 tons less than on May 1, and 851 less than recorded for June 1, 1889. Spot stocks are shown to have decreased during the month 480 tons in London and 700 tons in America, against 810 tons increase in Holland. The amount afloat for this country is made to appear 450 tons greater than a month ago, and the quantity for Europe 711 tons less. The general situation is thus strong, but apparently well discounted in present prices.

Lead.—The market has been very quiet the past week, but steady. Consumers manifest a very conservative tendency and speculation is quiet pending fresh incentive from Washington or elsewhere. Moderate quantities have been sold at 4¼¢ @ 4.30¢ here, which prices fairly reflect market value of the metal in carload lots at this writing.

Spelter.—A few carloads of prime Western were sold early in the week at 5.55¢ for June delivery. Subsequently four carloads went on the Metal Exchange at 5.47½¢ for July. Consumers appear to be well supplied, having ordered quite liberally last month, and the demand at present is moderate. However, 5½¢ is considered a close price for standard brands in carload lots and 5.60¢ is generally asked. About 15 carloads have been placed during the week.

Antimony.—The spot supply of Hallett's continues moderate, and high prices are still quoted in the foreign markets. Here about 20½¢ is named. Cookson's is rather easier, with 23¢ quoted.

Tin Plate.—The demand for futures has dropped off to unimportant proportions, and supplies are more readily obtained in the foreign market now than they were a week ago. Spot business has been moderate also, but steady prices have ruled, and the market shows fairly firm tone, despite the existing quietude. Consumption in the fruit and vegetable canning industry in the East is well up to the average for this season of the year, but Pacific Coast fruit and salmon packers are not using as much. The oil trade is taking the usual quantities. Out of town dealers stock up in a conservative way. Quotations for large lines, on the spot, are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$4.40; J. B. grade, do., \$4.47; Siemens Steel, \$4.65; Bessemer do., \$4.42. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$4.70; IX basis, \$5.70; Siemens Steel, IC basis, \$4.80; IX basis, \$5.80. IC Charcoals—Calland grade, ½X, \$5.50; Melyn grade, \$5.75; for each additional X add \$1.50; Allaway grade, \$4.90 @ \$5; Grange grade, \$5.10 @ \$5.15; for each additional X add \$1. Charcoal Tervs—Worcester, 14 x 20, \$4.90; 20 x 28, \$9.50; M. F., 14 x 20, \$6.90; do., 20 x 28, \$13.75; Dean, 14 x 20, \$4.55; do., 20 x 28, \$9.10; D. R. D. grade, 14 x 20, \$4.45; do., 20 x 28, \$8.90 @ \$9; Mansel, 14 x 20, \$4.50; do., 20 x 28, \$9; Alyn, 14 x 20, \$4.55; do., 20 x 28, \$9; Dyffryn, 14 x 20, \$4.65; do., 20 x 28, \$9.20; Wasters—S. T. P. grade, 14 x 20, \$4.20; do., 20 x 28, \$8.65; Abercarne grade, 14 x 20, \$4.20; do., 20 x 28, \$8.60.

New York Metal Exchange.

The following sales are reported:

WEDNESDAY, May 28.

10 tons Tin, August.....	21.15¢
10 tons Tin, prompt shipment.....	21.25¢
10 tons Tin, September.....	21.90¢

22 tons Spelter, July	5.55¢
15 tons Tin, prompt shipment	21.30¢
10 tons Tin, October	21.10¢

THURSDAY, May 29.

15 tons Tin, prompt shipment	21.25¢
10 tons Tin, October	21.10¢
20 tons Tin, August	21.10¢
20 tons Tin, September	21.15¢
20 tons Tin, October	21.15¢

MONDAY, June 2.

64 tons Spelter, July	5.47½¢
-----------------------	--------

TUESDAY, June 3.

10 tons Tin, July	20.90¢
10 tons Tin, June	21.00¢

Coal Market.

The Anthracite Coal market has stiffened in some particulars since the advance in prices a week ago. For example, Lehigh Coal, which before was scarcely sold at a profit, as claimed by agents, is now a shade better. At the same time, as asserted by some, the advance is only "on paper." The argument is that, so long as Coal is so plenty, so long as production is so abundant, Coal must be sold, if not at one price then another. To secure uniformity of prices, especially with large independent operators in the market, is not easily accomplished. The fact is, said one, "you can probably buy Coal as low now as before." The advance in Stove and Chestnut is 25¢, f.o.b., and Egg 15¢, while Broken remains unchanged, which is less sweeping than was reported while the Coal meeting was in session a week ago. The new prices compare with other seasons as follows:

	June, '90.	May, '90.	June, '89.
Broken	\$3.35	\$3.35	\$3.85
Egg	3.50	3.35	4.00
Stove	3.75	3.50	4.30
Chestnut	3.50	3.25	4.00

The order of the Delaware, Lackawanna and Western Company putting all their miners on full time was supplemented by similar orders from the Pennsylvania Coal Company and the Delaware and Hudson Company. More than 20,000 employees are affected.

The official statement of production for the week ending May 24 is as follows, compared with the same period last year:

Regions.	May 24, 1890.	May 25, 1889.	Decrease.
Wyoming	345,987	385,900	39,913
Lehigh	130,015	129,872	9,857
Schuylkill	171,511	223,453	51,942
Total	637,513	739,225	101,712

Year to date. 11,236,110 11,577,138 341,028

Eddy Creek Shaft, of the Delaware and Hudson Company at Olyphant, which was flooded nine months ago to prevent its destruction by fire, is now cleared of water. No 2 shaft has 16 feet of water remaining in it. The company are anxious to get these two mines in steady operation. The Bast Colliery at Ashland is still burning. This mine is one of Reading's largest.

An answer has been filed in the United States Circuit Court, at Pittsburgh, in the case of the Robert Morris Land and Coal Company against the Philadelphia and Reading Coal and Iron Company, which involves lands to the value of over \$20,000,000. The answer denies that the plaintiffs own any part of the lands in dispute. The lands yielded 1,200,000 tons of Coal per year.

The contract for Pardee's new breaker at Blackwood Colliery has been awarded.

The Bituminous Coal traffic is almost exclusively confined to contract deliveries. A Philadelphia despatch says the furnace and mill demand for both Anthracite and Bituminous Coal is increasing, and large contracts are now being placed to run to the end of the year.

The Tonawanda Iron and Steel Company, Tonawanda, N. Y., have placed

an order for three 18 x 70 Cowper-Kennedy hot blast stoves and 150 feet draft stack with Gordon, Strobel & Laureau, of Philadelphia, and contracted with the Brown Hoisting and Conveying Machine Company, of Cleveland, for a two-bridge hoist and conveyor for their ore dock. Julian Kennedy, consulting engineer, is furnishing the plans for and superintending the proposed improvements.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, June 4, 1890.

The market for Pig Iron is without new feature of any description, and speculation is unimportant. Cleveland shipments are a shade better, but warrants have gone still lower, selling down to 39/10½ Tuesday, and at the same figures to-day. Scotch shipping brands are still receding, and warrants are weak, with business at 43/9 yesterday and 43/10 to-day. Hematite warrants have dropped with the rest and were down this week to 51/3, but reacted to 52/6 to-day.

Steel Ship Plates are off to £6. 17/6 at Barrow. Rails, Blooms and Slabs are about 5/ lower, and quotations on Billets and Wire Rods are reduced 2/6, with business moderate in all departments.

Tin sold up to £95. 7/6, spot, under the influence of American demand, and a large business was done on the rise. On a cessation of demand prices afterward relapsed to the previous level. Owing to small direct shipments it is believed that the American market is chiefly dependent upon London to supplying its wants.

In Copper there is a fair business doing at about £54. 10/ for Merchant Bars. The position fully warrants the inference that consumption is outpacing the production, and higher prices are, therefore, considered as very probable. French stocks have been further largely reduced. Furnace material has continued active, and prices show a further advance, with Anaconda Matte up to 11/6 on actual sale. Large quantities have been sold for delivery during the balance of this year and into the first half of 1891. All the Anaconda Matte lying in Liverpool has been purchased for American account. The amount of stock involved in these transactions cannot be learned. Other sales include 300 tons Anaconda Matte at 11/3; 200 tons ditto at 11/6, and 800 tons Anaconda Argenterous on private terms.

For Tin Plates inquiries are still numerous, and a fairly large business is doing. Buyers for large parcels are making offers. Some accepted, but price not stated. The syndicate of London and American capitalists, which acquired the Forest and Worcester works at Swansea, is being transferred to a limited liability company. The capital necessary is about £400,000. Efforts are being made to retain Mr. Williams as managing director at a salary of £5000 per year.

Steel Rails.—Business has been light and makers are offering at rather lower prices. Heavy sections quoted at £4. 15/

and light sections £5. 5/ @ £6, f.o.b. at N. W. England shipping point.

Scotch Pig Iron.—There is no improvement in the demand and prices continue weak.

No. 1 Coltness, f.o.b. Glasgow	65/
No. 1 Summerlee, " "	63/
No. 1 Gartsherrie, " "	61/
No. 1 Langloan, " "	65/
No. 1 Carnboe, " "	45/6
No. 1 Shotts, " at Leith	62/6
No. 1 Glengarnock, " Ardrossan	62/
No. 1 Dalmeilington, " "	51/
No. 1 Eglinton, " "	46/6

Steamer freights, Glasgow to New York, 2/, nominal; Liverpool to New York, 10/.

Cleveland Pig.—The market weak and demand without improvement. Makers quote 40/3 for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—Makers prices have receded 2/ with warrants, and the demand is slow. West Coast brands, Nos. 1, 2 and 3, 55/, f.o.b. shipping port.

Spiegeleisen.—Former prices prevail and the demand is moderately active. English 20 % quoted at 95/ @ 97/6, f.o.b. shipping port.

Steel Blooms.—Very quiet market and lower prices. We quote £4. 12/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Inquiries are moderate and the tendency of prices is still in buyer's favor. Bessemer 2½ x 2½ inch, £5, f.o.b. at N. W. England shipping point.

Steel Slabs.—Lower prices again quoted without improving sales. Bessemer quoted at £5 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—A moderate business doing and prices without change. Tees quoted at £3 @ £3. 2/6, and Double Heads £3. 5/ @ £3. 7/6, f.o.b.

Scrap Iron.—No change in this line; the demand very slow. Heavy Wrought quoted £2. 15/ @ £2. 17/6, f.o.b.

Crop Ends.—Demand light and former prices asked. Bessemer quoted £2. 17/6 @ £3, f.o.b.

Tin Plate.—The market firm and demand fairly active. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/9 @	13/
IC Bessemer Steel, Coke finish	14/ @	14/3
IC Siemens " "	14/3 @	14/6
IC Coke, B. V. grade	13/9 @	13/
Charcoal Terne, Dean grade	14/ @	14/3

Manufactured Iron.—Demand does not improve and the market is rather weak, with lower quotations on Sheets and Welsh Bars. We quote, f.o.b. Liverpool:

Staff, Marked Bars	£ s. d.	£ s. d.
" Common	@	9 10 0
Staff, Bl'k Sheet, singles	@	7 10 0
Welsh Bars (f.o.b. Wales)	@	8 15 0

Tin.—The market very firm with offerings moderate. Straits quoted at £93. 17/6 @ £94, spot, and £94. 10/ @ £94. 12/6 for three months' futures.

Copper.—There is still a good demand and the market remains firm. Chili Bars quoted at £54. 7/6 @ £54. 10/, spot, and £54. 17/6 @ £55, three months' futures; Best selected, £61.

Lead.—A fairly active market but little change in prices. Quoted at £13 for Soft Spanish.

Spelter.—Prices are lower and the market is quiet. Quoted at £22. 15/ for Ordinary Silesian.

HARDWARE.

The Condition of Trade.

The past week, broken as it was by a holiday, has been characterized by no specially new developments in Hardware, the volume of business continuing moderate and prices remaining, with scarcely an exception, unchanged. There is, however, an improved feeling in heavy goods which lie near the raw material, owing to a somewhat better feeling in the Iron market, and the impression that a halt has been called finds confirmation, as there seems to be a slight reaction from some of the extreme prices which have been prevailing. In Shelf Goods there is nothing special to report and the market remains unchanged, with perhaps a slight weakness in certain lines. The gratifying reports which continue to be received in regard to crops, and prevailing prosperity in nearly all parts of the country, tend to reassure the trade and lead to the anticipation of a satisfactory business next fall, while the unsettled condition of the labor market and the strikes which are in progress in many communities tend to repress trade, especially in the line of Builders' Hardware.

As indicating the condition of business in the principal Hardware centers, we have pleasure of giving the following special reports, which will be found of particular value, embodying as they do the advices of prominent Hardware houses. It will be observed that almost uniformly they refer to the satisfactory condition of business, and allude to the outlook as promising.

Chicago.

(By Telegraph.)

The Hardware trade of this section has been more active than ever during the past week. Decoration Day was intended to be observed as a half holiday, but most establishments were so rushed with orders that nearly a full day was imperatively required in the shipping departments. The Saturday half holiday was also shortened for the same reason. Nearly every house here reports the past month as one of the busiest in their history. C. Sidney Shepard & Co. state that on Saturday their shipments exceeded those of any previous day since the establishment of their Chicago house. In Heavy Hardware business has been equally active. Prices are firmer. Good wood material is getting scarce and rates are being marked up. Buyers who keep close watch of the markets have noted the stiffness shown by iron makers recently and are beginning to come in and place contracts for the heavy material they will need. The movement in this direction is earlier than usual this year. Confidence in the future is being shown by the jobbers as well as their customers. Large stocks of goods have been contracted for, and as this was done when prices were scraping bottom, the trade here is well situated to take advantages of

any improvement either in demand or in prices. All kinds of staple goods are stiffening now. Sheet Iron, Barb Wire and Nails are all higher. Indications of an advance are seen in other goods also. The manufacturers of Stove Boards are not willing to make contracts at present, and the impression prevails that prices will be shoved up before they begin to sell. They have a good reason for insisting on better prices, having made up this seasons stock from Tin plates bought at the high rates ruling last fall.

Nails.—Manufacturers of both Cut and Wire Nails now have more orders than they can well take care of, and are growing very independent. Very large sales were made in the past week, and order books are now well filled for 30 to 60 bags. Jobbers cannot buy within 10 cents per keg as cheaply as they could two weeks ago, and their orders are being refused by concerns which were anxiously soliciting business at that time. Some Wire Nail makers ask \$2.30 at factory, but they are probably in advance of the others, although a few days may make that a bottom price if the buying movement continues. Cut Nails have also worked into pretty fair shape, and the makers are either withdrawing all quotations or asking more money. It is possible that \$1.75, at factory, may be beaten for Steel Nails, but there are very few sellers now at such a low price. Jobbers have advanced prices out of stock to \$2 for Cut Steel Nails, and \$2.50 for Wire Nails, with 5 cents off for carloads.

Barb Wire.—In this line also a very heavy business has been done, and manufacturers are now behind in their orders. The situation here has been radically changed. Prices have materially advanced this week and will, it is estimated, be higher before another report is issued. Jobbers quote small lots of Painted at \$2.90, with 5 cents off for carloads, and Galvanized 60 cents per 100 more.

San Francisco.

HUNTINGTON HOPKINS COMPANY.—Referring to the situation in the Hardware line will state that there has been no very material change since our last report, prices still ruling about the same, but trade more promising, and volume of sales larger.

Portland, Ore.

FOSTER & ROBERTSON.—The deep snow of January and the deep snow and floods of February materially affected trade for the two months mentioned, while just as business had fairly begun to get under motion there came a strike among the mechanics in our city; but in spite of these drawbacks trade is now moving at such a rate, often compelling us to work "double turn," that it bids fair by July 1, not only to equal but to somewhat exceed the trade of the same months of last year. It is the judgment of careful observers that

the entire volume of trade in the Pacific Northwest will be somewhat less than last year, and it is probable that their conclusions are correct. Notwithstanding this falling off, we believe that the jobbers here are doing and will do a much larger business than last year. A variety of causes contribute to this result, most prominent among which are larger varieties of goods, more modern and enterprising business methods, and closer prices than heretofore named on this coast. As may be naturally inferred, what Portland is gaining under such circumstances, with less trade as a whole on our territory, others must be losing. This we believe to be the case. It looks to us as if the enterprising activity of the Portland jobbers, together with the low prices now being made in this market, are rapidly driving out Eastern competition. As might be expected, the demand for Builders' Hardware has hardly been up to that of last year, but the largely increased trade in Cross-cut Saws, Axes and other lumbermens' supplies, together with a greater activity in Tinsplate and Tinnerns' Tools and Supplies, Pumps, Gas Pipe and kindred lines, has more than made good the slight shrinkage in Builders' Hardware. The outlook for crops this fall is excellent, and the probabilities are that Oregon, Washington and Idaho will show much the largest yield of grain in their history. This will undoubtedly result in general payment of accounts and an easy state of money matters along the entire coast.

St. Louis.

Jobbers of Hardware report a fairly satisfactory trade. The Southern dealer is awaiting the outcome of the crops before placing his order, and the next two months will be comparatively quiet so far as trade from that locality is concerned. The local trade, however, is unusually brisk, with a free movement in Shelf Hardware, Barb Wire, Iron and Wire Nails, Builders' Supplies, &c. Seasonable goods such as Refrigerators, Ice Cream Freezers and Screen Doors are in heavy demand. Prices are generally reported firm and the tendency toward lower values has been checked, and a movement in the other direction is generally anticipated. Taking the situation as a whole, it is quite encouraging and jobbers express themselves as well satisfied with the outlook.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—We are pleased to report a good steady trade in all lines of Hardware, sales for May being fully up to same month last year, and collections are much better. The demand for Barb Wire is unprecedented, mostly going out in small lots. Manufacturers are behind in their orders and unable to keep us fully supplied. Reports from the great wheat growing region northwest of us are very encouraging. Rain has fallen at frequent intervals, and the cool, backward spring has sent the roots of the young plant deep into the ground, and it is "stooling" out in fine shape. All reports agree that the crop has seldom presented a more favorable

prospect at this season of the year. As wheat is our great staple, the success or failure of a crop means a great deal to the wholesale merchants of the Twin Cities, and its progress is watched with much interest. Given a bountiful harvest and good prices, which the wheat dealers predict, and it will leave very little to be desired to make good times for the country merchants next fall. Since the opening of Lake Superior routes, freight rates from the Atlantic seaboard have declined very materially, and goods are now delivered in the Twin Cities from the East as cheaply as to Chicago, giving us a decided advantage, as we are 400 miles nearer the trade, thus saving the cost of that haul. The retail trade in both cities is now very active, and our city department is kept very busy filling orders.

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—For the past two weeks, or since our last report, trade in general has been moderately active. There is no extraordinary demand, but a fairly satisfactory business as far as volume is concerned has been enjoyed. Severe competition continues to exert a baneful influence in the matter of profits, and the prospects of closing the first half of the year with a respectable gain of "simoleons," cannot be regarded at the present time as very promising. We note an increased movement to the seaboard of the productions of the country west of us, and we are also encouraged by the fact that prices of these products are tending upward and toward a more remunerative basis. The weather so far has been exceptionally favorable to growing crops and we have yet to hear of complaints from any other of the "ills that crops are heir to." The McKinley bill just now is a fruitful topic of discussion among all classes.

Louisville.

W. B. BELKNAP & Co.—Trade conditions continue favorable. Good weather, succeeding a long, rainy period, has brought out the belated crops wonderfully, and although most of them are far behind, it is by no means certain that the yield will not be at least up to the average, possibly better. Notwithstanding the reported excessive production of Pig Iron, Steel Slabs and Billets are firmer and consequently the finished product. Cut Nails, which were demoralized at Wheeling for a few days, have recovered somewhat, and are now from 10 to 15 cents per keg higher than they were two weeks ago. Other articles sympathize and as midsummer is not far distant, when a hardening of prices is always looked for, we expect to see the market well sustained for some months to come. Our own State Legislature has joined the ranks of those who, with a desire to placate the country vote, have passed a so-called "Anti-Trust" bill. Like all such legislation designed to clog the wheels of commerce, it is destined to be inoperative, although the legal profession may have some pickings out of it before it is construed by the highest courts.

Cleveland.

THE W. BINGHAM COMPANY.—All the jobbing houses here are quite busy, the volume of business being considerably larger than a year ago. Travelers are sending in good orders, well assorted, for Shelf Hardware, and at fair prices. The demand for plain and Barbed Fence Wires keeps up, and prices are steady, with an upward tendency, and we think the bottom has been reached on these goods. Wire Nails are held from stock at \$2.35, Steel Cut Nails at \$1.85, with a fair demand for both. There is at present a large demand for Haying Tools. Orders for Lawn Mowers have been coming in freely of late, and the trade this year will be exceptionally large. The only drawback is that the manufacturers are unable to supply promptly. Taking business as a whole, it is very satisfactory. Collections are fair, and with a continuation of the fine weather we are now having the outlook for trade for the present month is very encouraging.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The volume of trade during the last two weeks has been quite equal, if not in excess of the preceding two, which naturally indicates that the trade have no excess of stock on hand, but have been buying for immediate wants. Orders arriving for Batchellers' Forks is in excess of the stock in the hands of jobbers. The demand for all harvesting tools has been quite large. The demand for Lawn Mowers has been so great that the stock in the hands of the leading manufactures has been exhausted, and they are depending upon their daily production to supply the daily demands. The trade on Barb Wire and on Wire Nails has been equal to the demand in previous years, and there is no large stocks in the hands of jobbers. Window Screens and Screen Doors are shipped out by the dray loads. These goods, as is always the case, are sold without much profit. From appearances, the first two weeks in June will be quite equal, if they do not surpass, the trade of 1888 or 1889.

Boston.

BIGELOW & DOWSE.—Everything looks prosperous and encouraging. The volume of business the past month has been unusually large. The sales of Wire and Screen goods has been checked in some sections of New England by the cold and wet weather. This has caused an increased sale for Lawn Mowers and a good outlook for Haying Tools this month. Our market is not as ready to accept high prices as the West, and many of the Western manufacturers of Wire and Cut Nails who have been selling largely here are likely to find that our home manufacturers are ready to take the trade back again. Carpet Tacks.

Barb Wire.

While there has been no important change in the condition of the Barb Wire market since our last report, it may be referred to as in a somewhat better condition in sympathy with the advance in raw material. While this has not greatly af-

ected quotations on the Wire there is a disposition to withdraw some of the extreme prices which have been made, and the market is accordingly a shade firmer; 3.15 cents may be named as a price for fair lots at mill, with concessions for large parcels. There is some unevenness in the quotations made for large lots, and many of the manufacturers refuse to meet figures named by others.

Wire Nails.

Wire Nails are in substantially the same condition as last week, but there are indications of improvement, and several of the manufacturers are naming slightly higher prices than ten days ago. The improved condition of the raw material tends to strengthen the market, together with the fact that a good many orders have been placed, and manufacturers generally report that they are full of orders. As a fair quotation for good lots at mill, \$2.15 at \$2.20 may be named. Small lots from store are selling at \$2.25 to \$2.50.

Cut Nails.

The market still continues irregular, the only feature being a disposition to ask more money for Steel Cut Nails. Iron Nails continue quotable at \$1.70 @ \$1.80 for carload lots on dock, while Steel Nails are 10¢ higher.

Miscellaneous Prices.

Waddel's Improved Coffee Mill, the Lone Star, described on page 972, and manufactured by Jno. M. Waddel Mtg. Company, Greenfield, Ohio, is listed at \$6 per dozen, which is subject to a discount of 40 per cent.

The following are revised discounts on the Galvanized and Sheet Iron Ware and House Furnishing Goods manufactured by A. H. Whiting, 468 and 470 Cherry street, New York:

	Discount.
Sap Bucket.....	Net.
Knickerbocker Garbage Cans and Covers.....	60&5 %
Knickerbocker Ash Cans and Covers.....	60&5 %
Wall Buckets, No. 1.....	50 %
" " No. 2.....	50 %
Knickerbocker Galvanized Pails.....	50&10 %
Galvanized Water Pails and Fire Buckets, No. 1, 50 %; No. 2, 40 %; No. 3, 60 %; No. 4, 35 %	
Coal Hods, plain, funnel and ladies' favorite, japanned.....	70&10 %
Coal Hods, plain, funnel and ladies' favorite, galvanized.....	70&10 %
Galvanized Chamber Pail, foot and bottom combined.....	50 %
Galvanized Sprinkling Pots.....	50&10 %
Galvanized Chamber Pail, Commode, sanitary.....	35&5 %
Galvanized Infants' Baths.....	50 %
" " Oval Foot Tubs.....	50 %
" " Lipped Pails.....	50 %
" " Wash Bowls.....	50 %
" " Wash Tubs.....	50 %
Refrigerator Pans, stamped.....	50 %
" " pieced.....	70 %
Basting Spoons, loop handled.....	75&5 %
" " wood handled.....	75&5 %
Flesh Forks, two pronged.....	75&10 %
" " three pronged.....	75&10 %
Cake Turners, loop handled.....	60 %
" " wood handled.....	60 %
Skimmers, loop handled.....	60 %
" " wood handled.....	60 %
Beer Measure.....	35&5 %
Fire Buckets, No. 1.....	50 %
Oil Waste Can.....	25 %
Gas Jet Guards.....	25 %
Can Handle and Clip.....	33&10 %
" " ".....	33&10 %
Ear, Handle and Clip.....	33&10 %
Back or Side Handle.....	30&10 %
Chamber Pail Breast.....	60&5 %
" " Bottoms.....	60&5 %
" " Covers.....	60&5 %

From a Western Hardware man we have the following on Countermanding Orders for goods, which doubtless brings out some points as yet untouched upon in the discussion of this matter:

You have published letters from the manufacturers, and doubtless will have something from the jobbers, showing how they are abused. I may be anticipating, but we retailers are not as much to blame as you will be led to suppose we are. In the first place we are taught by the traveling man that we have a perfect right to cancel any order up to the time of shipment. This is clearly brought out and impressed upon our mind where we are so earnestly solicited to place an order for future delivery. In fact, the salesman seems to consider no promised inducement too great to make to secure the order, except his limit in price. Prices are guaranteed, and any decline in prices at time of shipment will be credited to our account. Sometimes there is a little *sub rosa* discount which he gives us the advantage of as a particular friend. There is a possibility that among the many varieties of goods of the same class that will be offered before the season arrives we may see some that to us have more points of excellence than those we have placed our orders for. We are fixed on that class of goods unless we see something else we like better, and have placed our order to protect ourselves. At the same price and on the same conditions we are able to give our order for the line we prefer the most, as almost every one has instructions to "meet prices." We see nothing dishonorable in such a course for us merchants, because with an understanding of this kind the order was given. It is one of the results which competition seems to have made necessary. We retailers have the same experience. A party orders something we do not keep regularly in stock. It is ordered, and when it comes he has changed his mind about wanting it. He has been a good customer in the past, and it would not do to push him and make him pay for it; he knows, too, that in the future his dollars will be as acceptable to me as those of any one else, and so it goes. We wonder if our experience is different from others in these respects.

Items.

The failure of the ice crop is having an injurious effect upon such goods as Refrigerators, Water Coolers, Ice Cream Freezers, &c. This has naturally a tendency to raise the price of ice, and the dealers are doubtless taking advantage of the situation, and even in some parts of the country where there is really no shortage prices of ice have been advanced from 25 to 100 per cent. The sales of the manufacturers have been seriously diminished on this account, and the volume of trade during the month or two to come will depend very largely upon the prevalence of hot weather. The comparatively cool weather which has prevailed is referred to as curtailing the demand in many sections of the country. The wet, cold summers for the past two years have seriously interfered with the sale of Freezers and similar goods. The stocks of Freezers in merchants' hands are thought to be light, and when hot weather sets in it is anticipated that sales will largely increase.

W. A. Cook, of Aid & Cook, West Plains, Mo., has sold his interest to C. F. Coleman, who has been in the employment of the firm for several years. The style of the firm is now Aid & Coleman.

In reply to an inquiry that makes its periodical reappearance we would state that the term "penny," when used to mark the size of Nails, is supposed to be a corruption of pound. Thus a 4d Nail was

such that a thousand of them weighed 4 pounds, a 10d such that a thousand weighed 10 pounds. Originally the "hundred," when applied to Nails, was six score or 120, consequently the thousand was 1200.

The trade will observe the Special Notice on page 66, in which R. W. Cameron & Co., 23 South William street, New York, make an announcement in regard to the supplying of Rifles for the Public Schools Cadet Force in New South Wales. Particulars are given in regard to the manner in which tenders are to be made and the information which must accompany them.

Manufacturers of Sleigh Bells are not very busy this season, the fact that they have just had two open winters interfering materially with their business, considerable stocks of Bells having been carried over. One of the prominent manufacturers facetiously remarks that if they can succeed in diverting the Gulf Stream before the winter so that they can have some good snow storms next winter they will then be in a better position to speak favorably of trade.

In connection with the question which from time to time comes up in regard to the best methods of marking cutlery, the advertisement, page 70, in which J. R. Torrey & Co., Worcester, Mass., call attention to their Torrey's Gold Marking Ink, will be of interest. This Ink has been specially prepared for this purpose, and is warranted not to rust or injure goods. It is also put up, we are advised, in convenient form with full directions for use.

The trade will be interested in the announcement on page 69 in regard to Expanded Metal, with illustrations, showing some of the forms in which it is put on the market. Central Expanded Metal Company, Pittsburgh, Pa.; Northwestern Expanded Metal Company, of Chicago, Ill., and St. Louis Expanded Metal Company, St. Louis, Mo., are the manufacturers who are thus offering this interesting product, which appears to be adapted to many important uses. Some of its special features are enumerated in the advertisement.

One of the St. Louis papers gives an illustration of what is referred to as the largest coil of Wire Cable ever made in one piece. It was made by the Broderick & Bascom Rope Company, 704 and 706 North Main street, St. Louis, Mo. The weight of this coil is given as 110,000 pounds, and the length of cable 35,400 feet. The trade of this concern is alluded to as covering a large territory, extending from the Atlantic to the Pacific and from the Gulf of Mexico to the Lakes. We are advised an order was received by them this spring from Melbourne, Australia, for a cable which will weigh, when completed, 45,000 pounds.

The advertisement on page 53 illustrating some of the new and leading tools manufactured by Wells Bros. & Co., Greenfield, Mass., will be observed with interest, representing as it does a number of these well-known tools in small but clear cuts. Their catalogue showing their complete line is also alluded to.

The Grenada *Sentinel*, Grenada, Miss., publishes a cut of the Hardware store of R. Doak, of that place, with some interesting history of his business, which was begun in 1866, with a stock of tinware and a capital less than \$200. Mr. Doak afterward added Lamps, Coal Oil Stoves and other House Furnishing Goods. In 1877 the firm became Doak & Hart, and continued one year, when Mr. Hart died. Mr. Doak bought his partner's interest and continued the business. In 1884 Mr.

Lawrence went in business with Mr. Doak. In 1888 Mr. Lawrence died, since which time Mr. Doak has carried on the business in his own name. Mr. Doak is spoken of as having a number of other interests and as occupying a prominent position in the community.

The Nubian Iron Enamel Company, of Chicago, Ill., send a sample of the work done with their Enamel. It is a piece of sheet metal 3 x 6 inches, three edges folded to hold sandpaper for match scratching 2 x 3 inches, and above that their card, descriptive of their goods. There is a hole in the frame by which it may be convenient to hang when desired for use. In connection with it they issue a card calendar for June, 3 x 6 inches, which is also descriptive of their goods.

The Hardware Board of Trade, 4 and 6 Warren street, New York, has just closed its thirteenth year, and we are indebted to James H. Goldey, the treasurer, for the following statistics in regard to the first 100 firms who became members of the Board:

Firms still in existence, names unchanged.	57
Firms still in existence, names changed...	26
Firms failed.....	13
Firms gone out of business.....	4

Total.....100

James H. Bryan, Westfield, Mass., is now carrying on the wholesale and retail business in Hardware, Paints, Oils, Glass, &c., formerly conducted by Bryan & Gladwin.

Price-List Holder.

The question as to advisable methods of arranging prices for convenient use has already received some attention in these

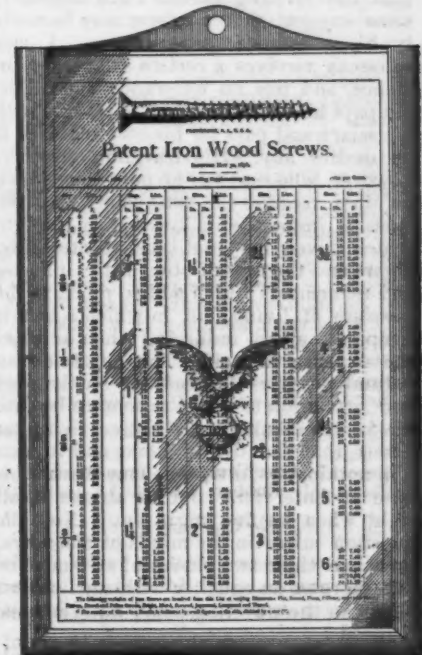


Fig. 433.—Price-List Holder.

columns, but it is obvious that the subject has not been exhausted. In connection with it the accompanying illustration may be of interest, representing as it does a method which is in use in the well arranged store of Meyer & Poehlman, South Bend, Ind. In this method of presenting list prices it will be observed that the list is placed in a tin frame with a glass over it, the frame having a hole in the top for attaching it to the shelving. The construction of the frame is simple, the edges of the tin being turned over to receive the glass and list. These price-list holders can obviously be made any size desired and lists contained in them may be either, as in this case, the printed list of the manufacturer or price-cards

which are specially prepared by the merchant. If desired, the holders can be painted some suitable color. The points made in regard to them are the attractive appearance they present and the fact that they keep the price-list clean.

Travelers' Expenses.

Stove manufacturers, wholesale hardware dealers, plumbers' supply houses, and all other interests seeking trade from retail dealers are deeply concerned in the question of economizing in the cost of distributing goods. Competition is now so keen in every line, and margins have been cut so close, that the pruning knife is being used wherever it is possible to lop off an item of expense which can be avoided. Having exhausted their resources in enforcing economies in almost every other direction, wistful eyes are being cast over the heavy account due to the ministrations of the trade missionaries. How to reduce the outlay in this respect is the problem which is wearying the brain of many a manager. Ask him whether he believes it possible to dispense with their services altogether, and he will reply in the negative most emphatically. Traveling salesmen are an imperative necessity. To do without them would be to withdraw one's self from a large part of the field now reached. Makers of special classes of goods may be able to reach their trade through circulars and advertisements alone, but those who handle staples must employ traveling salesmen. To abandon them and rely upon reputation to keep up patronage would be the abandonment of a staunch ship and reliance upon a leaky boat.

But while managers emphatically assert that the traveling salesman is a necessity, some suggest that a reform may be made in his allowance for expenses. A city salesman receives a certain salary, for instance, and has no allowance beyond it. He pays his board or keeps his family with his salary and pays for his own luxuries if he desires any. His traveling brother, however, who may sell no more goods than he does, receives the same salary and besides is granted an allowance by the firm which covers his hotel bills, theater bills, cigars and the cost of other little luxuries and refinements which add so much to the pleasure of living, but in which a man is temperate about indulging when he bears the expense himself. The city salesman naturally envies his brother on the road and gets a job to travel as soon as he can. He very probably gets better living at hotels than he did at home and it costs him nothing. In time he may elevate his nose at hotel fare, but he thinks it all right when he first starts out. Now the question arises in the minds of managers, how can these two classes of salesmen be put more on an equality with each other? How can the traveling man's allowance be reduced?

Clearly it would be an injustice to ask the traveling salesman to pay his own hotel bills, for he would probably have very little salary left, and besides, he would not live so expensively if stationed permanently at one point. But it is said that if a rate was fixed for a reasonable board per week and the house paid the excess over it, a saving of a very considerable sum weekly would be made by firms employing a number of travelers. A married salesman would object to this because his board on the road would then be added to his home expenses, and his surplus earnings would be greatly reduced. An unmarried man would not have this objection to urge, but would at the same time protest against any such interference with his legitimate perquisites. The discomforts of traveling, the dangers of the road, the prolonged absence from friends or one's family, and the devotion of his

entire time to his employer's interests, without regard to hours of opening and closing, will be urged strongly against any change from present methods of compensation. Our sympathies are enlisted strongly in favor of the untiring traveling man, but the reformer is on his trail and his privileges are in danger.

Price-Lists, Circulars, &c.

C. Sidney Shepard & Co., 23 and 25 Randolph street, Chicago, have issued a circular of seasonable and other goods, embracing 36 pages of illustrations and printed matter. The articles specially referred to are Tin Plates, Copper and other Metals, Wire, Sheet Iron, Seamless Straight Stamped Ware, Creamery Pail Trimmings, Dairy Supplies, Refrigerators, Water Coolers, Freezers, Cake and Pie Tins, Water Conductors, Metal Shingles, Dinner Pails and other Pieced Tinware, Lemon Squeezers, Ice Picks and sundries.

The Superior Machine Company, Springfield, Ohio, issue an illustrated price-list showing the various kinds and styles of Pumps manufactured by them. They call particular attention to their Bean Pneumatic Spray Pump, intended for the use of fruit growers; also the Bean Spray Nozzle used in connection with this Pump. Some testimonials from those using these Pumps are given.

Bellows & Dickey, 41 to 45 Viaduct, Cleveland, Ohio, manufacturers of Brass Signs, Cards and Letters, Box Dies, Iron Type House Numbers, Door Plates, Burning Brands, Seals, &c., issue an illustrated catalogue descriptive of their goods. In the upper left hand corner is a hole through the entire pamphlet with "hang it" immediately under it. They especially solicit all kinds of Punch Press and Screw Machine work. The catalogue covers an exceptionally complete line of the articles to which it relates.

Berger Bros., 237 Arch street, Philadelphia, Pa., manufacturers of Tinners' Hardware, Plumbers' and Roofers' Supplies, issue a 64-page illustrated price-list of their goods, which are too well known to need a detailed description of them. Their catalogue will be appreciated by those interested in these lines.

A. & E. Burton & Co., 21 Exchange street, Boston, Mass., are sending out an illustrated price-list of the Brushes manufactured by them. Their line consists of Paint, Varnish, Wall Whitewash, Skimming, Calsomine, Paper Hangers' Smoothing and Paste, Feather Dusters, Stove, Shoe, Horse, Dandy, Window, Tumbler, Hair, Cloth, Tooth, Nail, Bath and Flesh Brushes. They call attention to the fact that every Brush is warranted, and request customers to send for samples as the only way fair comparison can be made. They give useful information as to the best way of keeping Brushes, whether in stock or in use.

Fred W. Baker, 80 Exchange street, Rochester, N. Y., issues a four page circular illustrating the Kedzie Water Filter. These are made with reservoirs holding from 2 to 4 gallons each, and are referred to as having a capacity of from 3 to 6 barrels a day, according to size. The manufacturers allude to the fact that the Filters have been fully tested for many years throughout the United States, and their merits established as possessing every scientific and practical adaptation for family use. The Filters are described as being portable, durable, convenient and cheap.

The Bullock Bellows Company, 85 Columbus street, Cleveland, Ohio, issue an illustrated sheet and price-list of their Bellows, Forges, Tuyere, Blacksmiths' Tools, &c. The Forges are referred to as being arranged for either side or under blast.

The Tuyere are described as having a cam-shaped valve, which controls and regulates the blast to suit the fire required. The point is made that the valve, being cam-shaped, it is not likely to get clogged, as it can be turned away from any obstruction, allowing the fan of Tuyere to be cleaned without removing the fire.

Hall & Carpenter, 709 Market street, Philadelphia, Pa., are sending out to customers, as an advertising medium, a stamped tin picture frame, brass finished, 8 x 10 inches, in which is a representation of their Crown Scotch Proof Cooking Utensils, with the legend For Sale Here at the bottom of the picture. It is intended to lay on showcase or counter to attract notice.

Sidney Shepard & Co., Buffalo, N. Y., issue a circular, in which they call attention to the Buffalo Steam Egg Poacher, Shaker Sifter, and Buffalo Mincing Knife, to the special feature of which attention is called, and the fact emphasized that these articles received the highest award at the Paris Exposition.

The J. L. Mott Iron Works, New York and Chicago, have issued some exceptionally handsome trade publications descriptive of their extensive line of manufactures. The latest publication of the sort in some ways surpasses anything that we have seen in the line of trade literature. As it is bound in heavy gray paper we presume it must be classed as a pamphlet, though we feel safe in saying that few pamphlets of such a sumptuous nature have ever been issued from the printing press. The size of the publication is 16 x 22 inches and it contains 56 pages. Its contents are entirely devoted, or rather all but three pages are devoted, to Iron Vases manufactured by the J. L. Mott Iron Works. The beautiful execution of the engravings, the fine quality of the paper and printing, will warrant the work being classed more as an art publication than as a trade catalogue. Beyond saying that the Vases illustrated comprehend the wildest variety of design, some of which are exceptionally handsome specimens of cast iron work, it is difficult to say much in description of this unique publication. In all some 140 Vases are shown, varying in size and style from the smallest Funeral Urn to the large Lawn Vase, 5 feet or more in height. Between these limits there is an extensive variety of all styles, shapes and sizes of Lawn Vases and smaller Vases for interior use. Accompanying the illustrations are plate numbers, the name of the Vase and the briefest possible particulars of size and prices. The fact that these goods can be shown to advantage in a trade publication without any reference in their text to their merits of design or workmanship is a sufficient comment upon their quality.

Luke & Barnes, 208 South Third street, Grand Forks, N. Dak., show their enterprise by the issue of an illustrated catalogue of some of the leading goods they handle. These consist of Quick Meal Gasoline Stoves, Palace Queen Furnaces, Anti-Rusting Tinware, Stoves and Ranges, Refrigerators, Builders' Hardware, Prepared Paints, Carriages and Buggies, Farm Implements, &c. The little book is attractive in appearance and arranged for the convenience of their customers.

John W. Bell Company, Mercer, Pa., issue circulars describing their Eave Trough Hanger and giving a list of some of the jobbing houses who handle the goods. This Hanger is made of one piece of heavy galvanized Wire, and is so constructed that it fits the trough, and can be fastened by simply closing down a hook, thus holding the trough in shape and rendering inside pressing unnecessary. The ease and speed with which it

can be put on the trough and adjusted to the roof, together with the low price at which it is sold, are points which are referred to as contributing to its popularity. It is made in nine sizes and to fit trough from 3½ to 7 inches wide. We are advised that the sales this year are very satisfactory, being largely in excess of those of former years. In order to meet the demand facilities for its manufacture were largely increased last year.

We are indebted to the McNab & Harlin Mfg. Company, 56 John street, New York, for a copy of their illustrated catalogue of Boiler Tubes, Iron Pipe and Fittings, Brass and Iron Valves, Cocks, &c., for gas, steam and water; and Boiler Makers', Plumbers', Steam and Gas Fitters' Tools and Plumbers' Materials. The present is the seventh edition of the catalogue, the sixth edition having been published in 1888. The improvements in many lines of manufacture have, of course, led to several changes in the line of goods enumerated in the publication. It is too large a volume for us to give a detailed review of it, and it is hardly necessary to say more than that it embraces a full line of goods in the several departments of manufacture noticed. Beginning with Pipes, Oil Cups, Valves, Steam Cocks, Air Cocks, &c., the next articles taken up are Water Gauges, Brass Fittings, Gas Burners, Gongs and Boiler Tube Scrapers. The Plumbers' Goods occupy nearly 200 pages and include a varied line of Bibbs and Cocks, Wrought Iron Fittings, Lead Traps, Closets, Wash Stands, Sinks, &c. Several pages are also devoted to Radiators and Steam Heating Goods. Reference to the contents of the volume is made by means of an alphabetical index in the front. It remains to say a word about the general appearance of this publication, which ranks among the handsome and expensively gotten up books of this class. The volume is some 9½ x 12 inches in size, serviceable and substantially bound in stamped cloth boards. The paper is of a quality to make the cuts show to advantage, and the cuts themselves are well made. The number of illustrations in the catalogue may be understood when it is stated that there are nearly 400 pages and each page contains several cuts. Accompanying the catalogue is a carefully arranged price-list of handy size.

Batavia Wheel Co., Batavia, N. Y., issue a catalogue relating to their Clamps, Saw Handles, Saw Sets, Bolt Sets, Thill Couplers and Wagon Jacks, in which this line of goods is satisfactorily illustrated and described. They also issue a price-list of their Concealed Band, Shell Band and Plain Wood Hub Wheels. Attention is called to the quality of these Wheels and it is stated that nothing but the finest stock is used in their manufacture. Their strength and neatness of appearance are also alluded to and we are advised that the company's trade in them has nearly doubled from year to year.

E. S. & F. Bateman, Grenloch (late Spring Mills), Camden County, N. J., issue an illustrated catalogue of The Iron Age Farm and Garden Implements manufactured by them. They allude to their practice of making perfect Implements, and in such a manner as to stand practical use in the field. The catalogue contains 25 pages, and the illustrations cover a large line of Farm and Garden Tools, both hand and horse-power. They make the following announcement in regard to change in their address: "In a short time an extension of the P. & R. R.R. will be completed directly into our works, and in order to avoid miscarriage of freight, by reason of there being already another 'Spring Mill' near by, and on the same system, it has been decided to change the name of our town to Grenloch. The P.

O. Department has already made this change and announced it officially. Our correspondents will therefore kindly note the above and address us accordingly. It would be well to avoid possible delays in transmission, that the old name, Spring Mills, be added to the address for a short time."

F. E. Myers & Bros., Ashland, Ohio, are sending a new illustrated catalogue and price-list of 112 pages, showing the Pumps and Hay Tools manufactured by them. In April, 1885, by purchase from the Ashland Pump Company, they became the sole owners of all the original patterns and machinery used in the construction and manufacture of Pumps built by them. The catalogue shows a full line of all descriptions of Force and Lift Pumps, Windmill and Cyclone Force Pumps, Double Acting Spray Pumps, Pitcher Spout and Power Force Pumps. The Myers' Improved Patent Glass Valve Seat is referred to as having many advantages, being their exclusive property, and now used in all the Pumps they make. They are also extensive manufacturers of Hay Tools, including the New Departure Hay and Grain Carriers. They allude to the fact that by liberal advertising and reliable goods they have increased their business to its present dimensions. The catalogue before us is a handsome one and well arranged, and will be appreciated by the trade.

Baker & Hamilton, San Francisco and Sacramento, Cal., issue extra illustrated sheets to be pasted in their No. 23 catalogue. These show Locks, Latches, Carpenter Tools, Agricultural Implements, Feed Cutters, Road Carts, &c. They also print in convenient form the cards of Cut and Standard Steel Wire Nails, as adopted by the Nail manufacturers March 15, 1890.

The Hiram Holt Company, East Wilton, Maine, issue a circular relating to the Lightning Hay Knife, in which they cite the opinion of Justice Wallace affirming the validity of their trade-mark Lightning. They refer also to the position in the market occupied by their Knife.

S. P. & W. H. Smith, 109 California street, San Francisco, Cal., issue a circular under date of April 1, 1890, showing that they are selling agents for Cattaraugus Cutlery Company, of Little Valley, N. Y.; the Ellrich Hardware Mfg. Company, Plantville, Conn., and the Batavia Wheel Company, Batavia, N. Y., some of whose goods are illustrated.

Robert Murphy, 18 Harvard Place, Boston, Mass., has just issued an illustrated catalogue and price-list descriptive of the large line of goods manufactured by him. These consist of Corkscrews, Shoe and Rubber Knives, Oyster, Clam and Mackerel Knives, Carpet, Banana, Cigar and Paper Hanger's Knives, Shirt and Extension Knife Blades and Handles, Sardine Shears, Butter and Cheese Tryers, Wood Turners' Parting and Sizing Tools, Pinking Irons, Fish and Eel Spears and Wood Engravers' Tools. This pamphlet contains 16 pages, is of large size and illustrated profusely, and will be valued by those interested in these lines.

George R. Bidwell, 308 and 310 West Fifty-ninth street, New York, has issued his spring catalogue of Safeties, Ordinaries, Rationals, Tricycles, Velocipedes and sundries. The catalogue is copiously illustrated and much interesting matter is given descriptive of the extensive assortment of goods for which Mr. Bidwell is manufacturers' agent.

Higginan Mfg. Corporation, Higginan, Conn., and 189 and 191 Water street, New York, issue a circular relating to the Samson Jack which they are now manufacturing and putting on the market, and which was described in our columns

some months since. The durability and satisfactory operation of these Jacks and their great power, quickness of motion and saving of time and labor are points made in regard to them. They are made in four sizes, No. 0, No. 1, No. 2 and No. 2 with drop hook, which weigh respectively 12, 17, 27 and 32 pounds complete.

The Aultman & Taylor Company, Mansfield, Ohio, issue an illustrated catalogue of their productions. Their Engines, Separators, Horse-Powers, Saw Mills, &c., are described, showing the advantages they possess. Prosperity and Power are represented on the first page by the mechanic and farmer shaking hands, with a traction engine and threshing machine in the background.

The Ashtabula Tool Company, Ashtabula, Ohio, issue a very attractive catalogue of their Diamond Farming Tools. The front cover represents an Ohio lassie coming through a meadow with one of their Diamond Bow Rakes across her shoulders, and the back cover has an illustration of their works. The covers are effective in color and neat in design. The illustrations of tools and the printing between covers is in blue ink, with the company's monogram at the top of each page. The last page has a condensed price-list of the Diamond Tools which will doubtless prove a convenience.

The Belcher & Taylor Agricultural Tool Company, Chicopee Falls, Mass., issue the fourteenth edition of their descriptive and illustrated catalogue and price-list of goods manufactured and for sale by them. These consist of Feed Cutters, Vegetable Cutters, Corn Shellers, Plows, Harrows, Cultivators, Wheelbarrows, Trucks, &c. These goods are all referred to as being reliable and possessing desirable advantages.

R. Bliss Mfg. Company, Pawtucket, R. I., issue a 22-page illustrated price-list of the goods manufactured by them. These consist of Lawn Tennis Racquets, and Suffle's Hand and Bench Screws, Cabinet and Pianoforte Makers' Clamps, Chisel, Brad Awl, Anger and File Handles; also Mallets, Bookbinders' Presses, Brass and Iron Founders' Flask Clamps, &c. They allude to the fact that it is not their aim to make the lowest priced goods, but genuine New England standard goods.

The Lufkin Rule Company, Cleveland, Ohio, in their pamphlet B present illustrations of an interesting variety of Steel Tapes and Rules. The Steel Tapes are referred to as coming into more general use, and are made from 2 feet to 100 feet in length for surveyors, engineers and bridge builders' use. Folding Pocket Rules are made from 1 to 4 feet in length, and are described as being neat and convenient, and being made of Steel, will bend to a 3-inch circle. Their Magic Pattern Rule is also illustrated. A new edition of their complete catalogue, embracing all the goods they manufacture, will soon be issued.

The Bridgeport Chain Company, Bridgeport, Conn., issue an attractive illustrated catalogue and price-list, showing an interesting line of Chains, noticeable among which are their Tie Out Chains, Trace Chains, Cow Ties, Dog Furnishings, Heel Chains, &c. On page 14 illustrations are given of No. 4 Triumph Chain hooked to No. 6 Iron Jack Chain for testing, also the same Chains after testing, the links of the Jack Chain having straightened out under the pull, the Triumph remaining intact. The company are putting on the market a line of Brown Patent Wire Chain, of which a few sizes are ready for market.

Austen & Eddy, 117 and 119 Broad street, Boston, Mass., manufacturers and agents, issue a catalogue descriptive of the goods handled by them. The goods they

manufacture are referred to as being Blind Trimmings, Deline's Automatic Beam Clamps, Standard Zinc Glaziers' Points, Enterprise Pulley Mortises and Pulleys for same, Steel Panel or Veneer Points and Boardman's Blind Staples. They also deal extensively in Belt Hooks and Studs, Wire Nails, Brads and Dowels, Blind Wirers, Brad Drivers, Files, Diamond Glaziers' Points, Glue, Sash Weights and Cord, Sand Paper, Screws and Stair Rail Screws. They allude to their purpose of carrying a full line of specialties used by manufacturers of Sash, Doors, Blinds, Furniture, &c. They call especial attention to their Pulley Mortiser, which is described as making four Mortises with one operation, and as requiring no hand work after leaving the machine. It also possesses many other points of merit. The distribution of these machines, it is stated, has reached 400 in the United States, showing the extent of their popularity.

The Racine Maleable and Wrought Iron Company, Racine, Wis., for whom Rockwell & Rupel, 151 and 153 Washington street, Chicago, Ill., are agents, issue an illustrated price-list describing their Racine Automatic Steel Copying Press. Referring to its construction, they allude to the fact that they have concluded to retain the bottom spring, as they specially recommend it for large offices where extraordinary and constant strain is demanded. The Press is described as capable of instant adjustment for different size books, or giving extra pressure by raising or lowering the follower or top plate by aid of the wheel.

Reed & Prince, Worcester, Mass., manufacturers of Rivets, Burrs, Stove Bolts, &c., issue a convenient price-list, illustrating their goods. They refer to the fact that they make to order Pointed Wires, Wires straightened and cut to lengths, Hinge Pins, Blank Pins, Caster Pins, Crank Handle Pins, Blanks milled or drilled at either or both ends, Copper and Brass Rivets, &c.

The National Telephone Mfg. Company, 620 Atlantic avenue, Boston, Mass., issue circulars describing the Bennett Non-Electric Telephone apparatus for private lines. The Bennett Telephone system is spoken of as being desirable when wishing to communicate between points within distances not exceeding 3000 to 4000 feet. The instruments are referred to as being sold outright, and the lines as being easily erected and maintained.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

The general distribution of the leading goods in this line has been fairly satisfactory. Purchases have not, to all accounts, averaged quite as large this week as during the preceding fortnight, and the aggregate movement shows some tapering off, as not unusual at the turn of the month. However, manufacturers and jobbers, with few exceptions, remark that as large quantities of goods have passed into the channels of consumption as customary at this season of the year, and the volume of business during May is represented as comparing most favorably with that of the corresponding period last year.

Prices have ruled remarkably steady throughout the spring months, but the summer season starts in with a break on White Lead, Red Lead and Litharge that is liable to not only unsettle the market for those goods, but to have a demoralizing effect upon mixed Leads and ready-mixed Paints. Owing to the high cost of Quicksilver manufacturers of Quicksilver Vermilion have advanced their prices for Quicksilver Vermilion 2½¢ per lb. The quotations at present are 72½¢ for bulk lots, 73½¢ for bags and 77½¢ for smaller quantities.

White Lead.—All the corrodors connected with the National Lead Trust have issued new price-lists showing ½¢ decline on White Lead in Oil; quoting Dry Lead at the same figures; throwing aside the rebate plan altogether and suspending the prepayment of freights. In other words, the Trust has completely revolutionized the plans that have been in operation the past five months and returned to ordinary business methods. The radical change has been brought about chiefly by underselling on the part of Whittier, Fuller & Co., a large California corrodor firm, and the probability that a resuscitated Boston establishment, the Forest River White Lead Works, in which the Chadwick Lead Mfg. Company management is conspicuous, will soon be a competitor that needs looking after. Under the new plans adopted by the Trust no effort is made to control jobbers' prices. The jobbers in fact are entirely free from all restraint and may sell at whatever prices they see fit, which is equivalent to saying that White Lead will again be used as a "leader." A significant feature in the new lists is that all prices quoted are "subject to change without." In other words it is to be inferred that the first movement in a lively warfare has been made and that the battle will continue until outside competitors are either swamped or absorbed by the Trust. Meanwhile business in the Pigment is more than likely to be very risky for jobbers and retailers who may venture to put in anywise extensive supplies. With respect to settlements under former terms, it is announced that rebates due on purchases made between January 1 and May 31 will be in the same relative proportion that the period bears to the entire year. Thus 4% will be allowed on aggregate purchases of 2,500 lb and over; 6% on 8,333 lb and over; 8% on 20,833 lb and over; 10% on 41,666 lb and over. The new list is as follows:

White Lead, Dry or in Oil, in Kegs.

In lots of less than 1000 lb.....	7¢, net
In lots of 1000 lb to 5 tons at one purchase.....	6½¢
In lots of 5 tons to 12 tons at one purchase.....	6¼¢
In lots of 12 tons and over in one purchase.....	6¼¢

Dry White Lead in barrels, ½¢ less than price in kegs; Pure White Lead in 12½lb tin pails (packed in 100lb cases), 1¢ per pound over price in kegs; in 25 and 50lb tin pails (packed in 100lb or 200lb cases), ½¢ over price in kegs; in 1lb, 2lb, 3lb and 5lb cans, assorted (packed in 100lb cases), 2½¢ over price in kegs.

Terms.—On lots of 1000 lb and over, 60 days, or 2½% discount for cash if paid in 15 days from date of invoice.

Red Lead and Litharge.—These Pigments are subject to the same conditions that at present govern transactions in White Lead, with prices revised as follows, by manufacturers in the National Lead Trust:

	In kegs.	In bbls. and ½ bbls.
In lots less than 1000 lb.....	7¢	6½¢
In lots of 1000 lb to 5 tons.....	6½¢	6¼¢
In lots of 5 tons to 12 tons.....	6¼¢	6¼¢
In lots of 12 tons and over.....	6¼¢	6¢

Zincs.—The position of the market for American Oxide continues strong. Current distribution is taking up the output very closely and that fact, along with the

comparatively high cost of ores, keeps prices very firm. No changes in manufacturers' figures are announced, however, and jobbers are selling at practically the same prices that ruled 60 days ago. Foreign Zincs move in moderate sized lots only, but to a very fair extent and at old prices.

Colors.—There is no particular change in the character and volume of trade in staple colors. The varieties chiefly employed by house painters are moving off very readily, bulky goods used by grinders are doing quite as well, and the distribution of Paris Green and other insecticides increases gradually, as usual at this period of the year. Prices show no important variation and, as a whole, are quite firm.

Miscellaneous.—Ready Mixed Paints are selling quite as freely as at any previous time this season and more extensively than at the corresponding period last year. There have been some arrivals of Chalk by steamer, but not enough to affect prices for the article. Whiting sells at old quotations as does Paris White, and the movement of both articles is very fair.

Oils and Turpentine.

Buyers' operations in Animal and Vegetable Oils generally have been of perfunctory character. Nothing has developed in the way of export demand, speculative movements or fluctuation in value of raw materials that would prompt purchases in excess of immediate requirements. However, the movement of the leading varieties into the channels of consumption seems to be in line with what is customary at this season of the year, and present indications point to steady markets ahead. Fluctuations in prices the past week have been unimportant. Turpentine has moved off rather more freely, and the market is steadier with little change from last week's lowest prices.

Linseed Oil.—City made Oil has continued to meet with free sale, and the market remains very firm, with prices standing as quoted heretofore. Outside brands come this way in moderate quantities only, and the receipts are marked off readily at 60¢. Calcutta seed product, of local mills, brings 64¢, but domestic seed Oil at 2¢ less continues to be given the preference by most buyers.

Cotton Seed Oil.—Both crude and refined Oils have been very steady at former prices. The demand latterly has run chiefly on small lots for home account, but the supply offering is moderate, and competition seems to be very temperate. Last transactions reported were at 33¢ for Prime Crude, and 37¢ for Summer Yellow.

Lard Oil.—The market is slightly weak under the influence of fairly free offerings, but 52¢ seems yet to be a close price for prime quality Oil. There is a very steady demand for moderate quantities, but little or no inquiry for large lots.

Fish Oils.—Reports from the Menhaden fishing indicate a very light run of fish thus far, and poor yield from those taken. The moderate stock of crude Oil in first hands is therefore very firmly held. Pressed and Bleached Menhaden and Tanners' Oils are correspondingly firm. Crude Sperm and Whale Oils have had no important movement, and the manufactured products are selling to about the usual extent at steady prices.

Olive Oil.—In barrels is still rather irregular, varying all the way from 78¢ to 82¢, according to size of lot handled and quality. The demand is moderate.

Spirits Turpentine.—The local distribution has been fairly large, but liberal arrivals keep spot supplies here quite large. There are at present about 1000 barrels here in first hands. Prices have ruled barely steady at 37¢ @ 37½¢, according to size of lot.

Broncho Safety Bicycle.

Murray V. Livingston, Westboro, Mass., is putting on the market this machine, which is represented in the accompanying engraving. The leading feature of the

ball-bearing disc, and the point is made that its application in a machine is attended with less expense than the customary chain arrangement. The construction of the Broncho is referred to as very simple, and the increased speed resulting

block is intended to cause the trigger to pull hard or easy by adjusting it. These rifles are made with either nickel or blue barrels and with two styles of butts. It is expected that this neat and well made article will meet with a good demand.



Broncho Safety Bicycle.

cycle, which has two 30-inch wheels, is the entire absence of any chain or chain wheels, the gearing up being effected by means of a patent action contained in the hub of the driving wheel. Concerning this action we extract the following from the manufacturer's circular:

The axle is in the form of a cross. There are four miter gears, one of which is forced on and keyed to the left hand ball case, and, of

from the employment of the novel gearing above referred to is especially emphasized.

Junior Safety Rifles.

H. M. Quackenbush, Herkimer, N. Y., is producing a safety rifle, as illustrated in Fig. 1. The whole length, 33



Fig. 1.—Junior Safety Rifle.

course, is immovable. Another is forced on and keyed to the right hand hub end and turns with the wheel, of which it is a part. On the arms of the cross of the axle are the other two gears, which are on ball bearings. When the axle is made to revolve these gears are carried around with it, and being in mesh with both the immovable gear and the one keyed to the hub, transmit one revolution to the hub by their motion with the axle, and also one revolution from the fixed gear in which they run, thus giving two complete revolutions to the wheel to one revolution of the crank and about five rods of air line to your opponent's four.

It is stated that the machine fitted with this gear has been tested and that it works very satisfactorily, and with scarcely any more friction than that of an ordinary ball-bearing. The noiseless running of the wheel and the absence of back lash are also referred to. It is explained that this gearing is suitable to any direct driven machine, and especially to the ordinary bicycle, and when fitted to a rear driving safety through the absence of the bottom bracket the length of the machine may be considerably reduced. The gearing is adjustable by means of the ordinary

inches; weight, about 4 pounds, and is calibered for 22-100 BB or long and short cartridges. This rifle has a steel nickel plated skeleton stock or shoulder rest which can be instantly detached for carrying in a small space, reducing the entire length to that of the barrel, which is about 20 inches. Fig. 2 illustrates the breech



Fig. 2.—Junior Safety Rifle.

swung aside to allow the cartridge to be inserted or extracted. The rifle is cocked by drawing back the small screw *a* in the breech block. The set screw, *c*, in breech

Hatch Patent Bolt and Washer.

The Chicago Drop Forge and Foundry Company, Kensington, Ill., manufacturers of solid steel forged shears and scissors,



Fig. 1.—Hatch Patent Bolt and Washer.

for whom S. A. Haines Co., 90 Chambers street, are selling agents, call attention to the superior qualities possessed by the Hatch patent bolt and washer as a scissor and shear coupling illustrated herewith. They allude to the fact that



Fig. 2.—Hatch Patent Shear Coupling.

with the coupling generally used the threads in the shear are harder than those upon the screw, and as the screw turns in and out the thread is apt to strip. With the Hatch patent shear coupling they state there is no thread in the shear, and with the brass nut, which is softer than the screw, there is no chance of the thread stripping, and at the same time the rubber washer gives elasticity sufficient to allow the blades to move without grinding one another on the cutting edge. This coupling they refer to as being used on all their solid forged steel shears.

Colton's Key-Ring Screw Driver.

The accompanying cuts illustrate a novelty which seems to be well adapted to catch the popular fancy. It is a pocket screw driver, of the size and appearance of an ordinary Yale lock key, intended to be carried on the customary key ring, and has



Fig. 1.—Key Ring Screw Driver, Open.

two blades of different sizes ready for instant use. Those who have broken the blades of good penknives trying to use them as screw drivers in a sudden emergency will appreciate the value of this little tool. Figure 1 shows the screw driver open, ready to be taken off or put on a key ring. Figure 2 shows its appearance and size when closed. Slight projections on the head of the tool cause it to lock tight enough to prevent it from

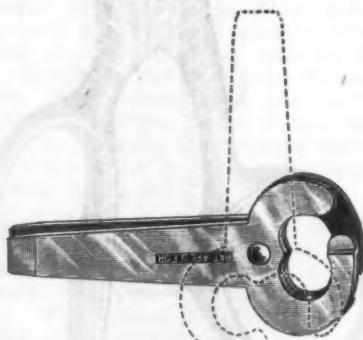
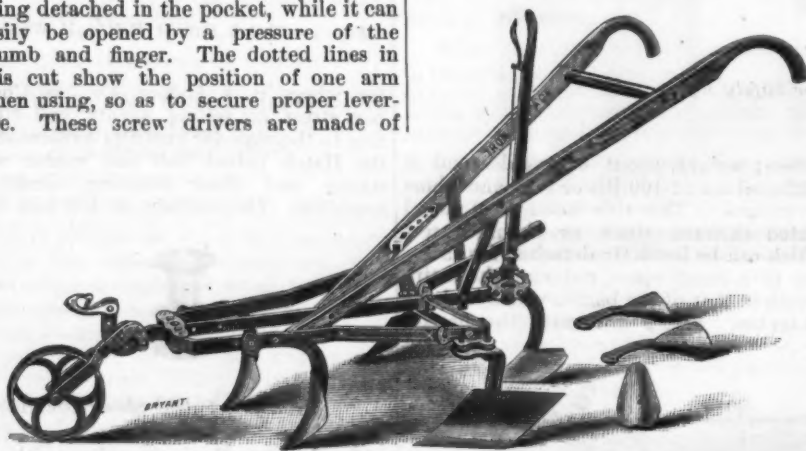


Fig. 2.—Key Ring Screw Driver, Closed.

being detached in the pocket, while it can easily be opened by a pressure of the thumb and finger. The dotted lines in this cut show the position of one arm when using, so as to secure proper leverage. These screw drivers are made of



Iron Age Cultivator.

tool steel, oil tempered, and are strong enough for all general purposes. H. H. & C. L. Munger, 142 Lake street, Chicago, are sole agents for the Manufacturers.

A stock company have been organized at Springfield, Mass., to manufacture the Bartlett Automatic Elevator Gate. The capital stock of the company is \$10,000, and they are organized under the name of the

Bartlett Automatic Gate Company, with F. K. Bartlett president, and W. F. Hurd, of Bridgeport, Conn., treasurer.

The Lone Star Side Coffee Mill.

The Jno. M. Waddel Mfg. Company, Greenfield, Ohio, are making a new side coffee mill, the Lone Star, as shown in the illustrations given herewith. The advantages claimed for it are that it may readily be attached to the face of a door, window casing, or the wall, as shown in Fig. 1. The mill has a deep hopper and large grinding parts, which are so constructed as to pulverize coffee fine as flour if desired. Fig. 2 illustrates the Lone Star folded up when not in use, and projecting

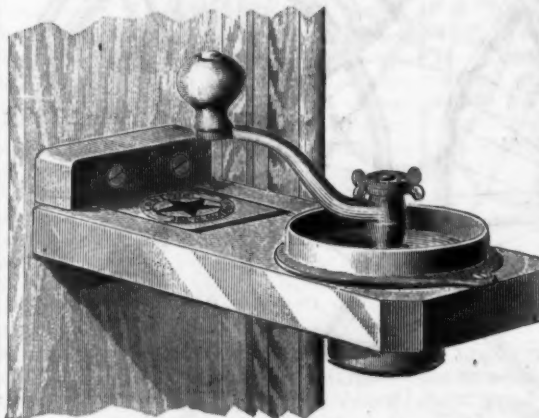


Fig. 1.—Lone Star Side Mill.

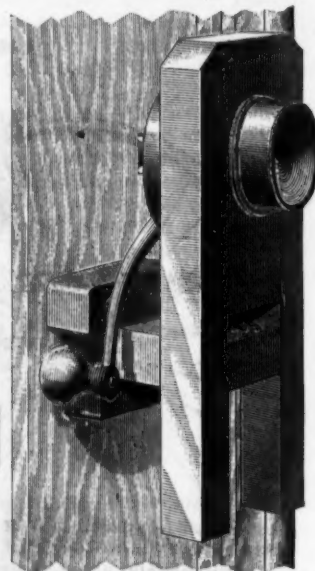


Fig. 2.—The Lone Star Folded Up.

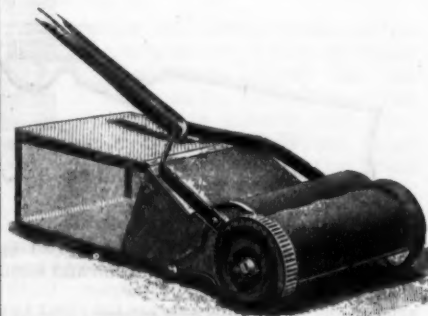
but 4 inches from the wall. It is equally well adapted for grinding either coffee or spices.

Iron Age Cultivator, with Lever Adjustment.

E. S. & F. Bateman Grenloch (late Spring Mills), N. J., are putting on the market the Iron Age Cultivator, in an improved form, with lever adjustment as illustrated herewith. The prominent feature in this cultivator, we are advised, is the manner of instantly opening or closing it while in its forward progress. This

The design of the sweeper is to remove all loose particles such as stones, sticks, straws, bones, leaves, &c., from the uncut lawn, and also to sweep up the loose grass after it has been mowed, leaving the lawn in a smooth and velvety condition. It is intimated that this is done in less time and more effectively than with a metal rake, which is apt to irritate the roots and frequently tears the sod.

The fact is alluded to that the sweeper can be run from a smooth surface to a



The Elkhart Lawn Sweeper.

rough one, or upon an uncut lawn, without changing its adjustment, and that it will be found useful in sweeping stone walks or pavements. The sizes ready for the market now are 12, 15, 18 and 22 inches, and we are advised that by July 1 a one-horse sweeper will be ready for parks, wide walks, macadamized and asphalt pavements.

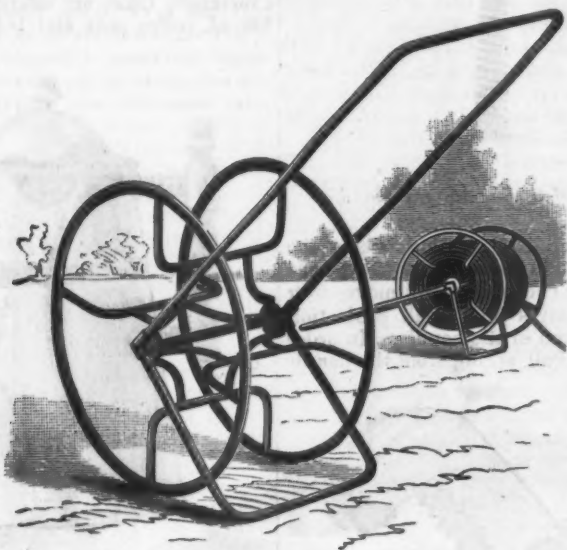
Brockton, Mass., has another new industry. G. A. Carter has just completed a tack factory, the main building of which is 56 x 35 feet, two stories high. An electric motor runs the machinery. There are 32 tack machines now running, and more are to be added. The machines are of latest design, and have a capacity of running 15 or 20 times faster than the average

is described as being accomplished by the use of a double set of expanding bars on the toggle joint, which is alluded to as largely overcoming the inherent weakness and general shakiness which is usually found in such tools. The point is made that by the change of a bolt an independent adjustment of the right hand bar, often called for in the proper working of the tool, can be secured.

Wirt's All Iron Hose Reel.

The firm of Wirt & Wait, Independence, Mo., are putting on the market an all metal hose reel, as illustrated herewith. The frame is malleable iron, and the

and all other freight will be run by an independent track in the suburbs of Reading, instead of through the city; a new bridge will be built across the Schuylkill, and sidings will be extended to the Carpenter Steel Works and to the Manhattan



Wirt's All Iron Hose Reel.

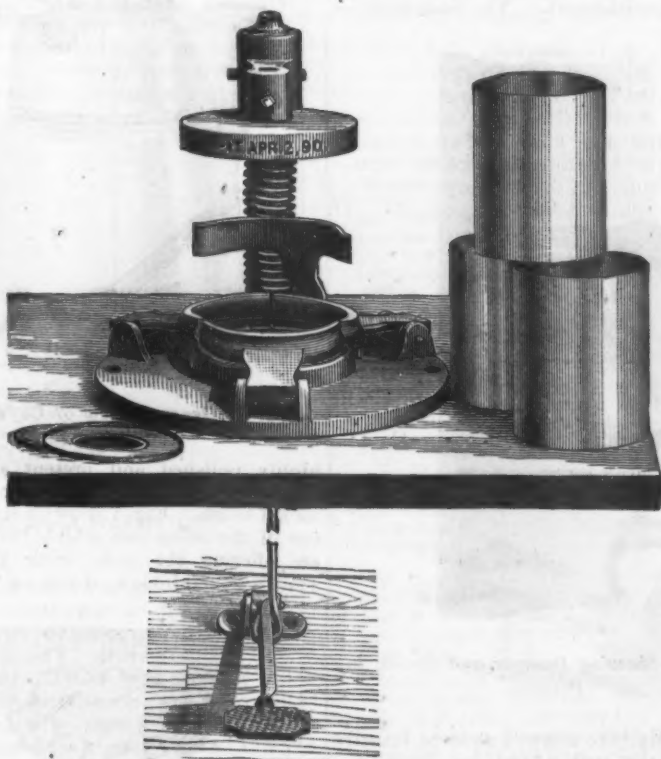
wheels, handle and support are light gas pipe. This is claimed to possess an advantage over the wooden reel, being much more durable and about as light. The 24-inch reel weighs 20 pounds and holds 100 feet of hose, while the 32-inch reel is but 32 pounds in weight and holds 500 feet of hose. It is also referred to as peculiarly adapted to dry climates, in which a wooden reel would fall to pieces from the effects of heat.

The larger figure in the cut shows the position of the reel when used to sup-

port the hose in sprinkling the lawn, while the smaller represents the reel placed to wind the hose on.

Jones' Patent Can Header.

The Dover Machine Works and Foundry, located at Dover, Del., have placed upon the market a machine designed for putting



Jones' Patent Can Header.

port the hose in sprinkling the lawn, while the smaller represents the reel placed to wind the hose on.

The Reading Railroad Company shows much energy in obtaining a direct route to tidewater for its enormous output. Coal

the trimmings on tin cans for the packing of meats, vegetables, fruits and the like. This machine, which was recently patented by Mr. E. L. Jones, of the company, is simple in construction, portable in form, easily placed in position and occupies but very little space. As will be seen from an

inspection of the accompanying illustration the machine is operated by foot power. Among the advantages claimed for it are that the trimmings are put on much tighter than would be possible by hand, that less solder is required in the execution of the work and that a boy can put heads and bottoms on 4000 cans per day. The machine is well made and will be found useful and economical for manufacturers of tin cans for the packing trades.

The Howard Improved Damper Regulator.

A new damper regulator is being put upon the market by the Howard Furnace Company, Syracuse, N. Y., the general features of which will be understood by reference to the cut presented herewith. The device consists of a metal plate finished in either nickel or bronze, about 7 inches long by 3 inches wide, to the center of which a thermometer is attached. The nickel draft chain is an endless chain and can be operated at will from either side, and is held at any position in which it is



The Howard Improved Damper Regulator.

placed. It is mentioned that no thumb screws or other appliances are necessary to hold the chain, as it is kept in place by friction. It is pointed out that with this device drafts can be regulated without the necessity of going to the regulator to change them. A special feature of the Howard system of damper regulation referred to is that they do not put a damper in the smoke pipe, but check the draft as near the fire-pot as practicable. The check draft is taken directly over the ash pit, or where the air is fed to the fire, and opening the check draft into the radiator the supply of air to the fire is retarded and passes into the lower radiator and thence to the smoke pipe and chimney, thus checking the consumption of fuel. It is mentioned that these regulators are furnished only with the Howard furnace and without extra charge.

The Maine shipyards are full of work, mostly in the construction of four-masted schooners. A vessel of this class, building by Killey, Spear & Co., will be 280 feet in length, 46 feet wide and 21 feet deep, the largest ever put afloat.

The Graham Patent Vise Wrench.

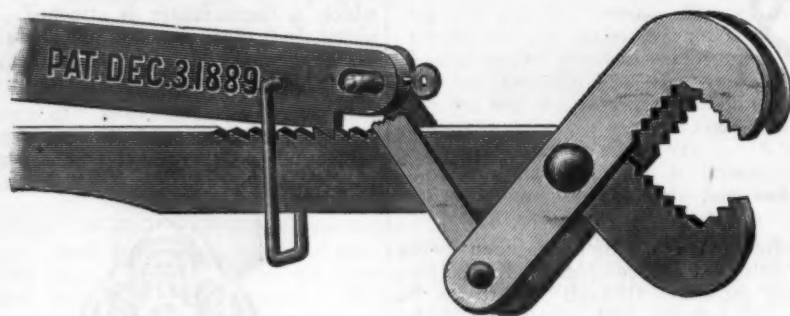
The Graham Vise Wrench Company, 503 Connecticut street, Buffalo, N. Y., are introducing the Graham Patent Vise Wrench illustrated herewith. This vise wrench, we are advised, is patented in the United States, England and Canada. They are made in four numbers, 1, 2, 3 and 4, and are intended to take pipe from $\frac{1}{4}$ inch to 6 inches. When the wrench is applied to a pipe, the jaws are brought in contact with the opposite sides of the pipe by sliding the auxilliary lever or handle backward on the main lever or handle, the auxilliary lever is turned toward the main lever, the cam or spud of the auxilliary lever forming the fulcrum on which it turns. In the auxilliary lever a slot and screw may be seen; this is intended to regulate the grip, the screw being described as acting on the bolt that connects the auxilliary lever with the toggles, the

serted with its blade in the pipe, and is removed with equal facility through a suitable opening in the pipe. The coil spring shown in Fig. 2 of the engravings is applied to the handle of the damper in-



Fig. 2.—Coil Spring for the Handle.

indicated by Fig. 1 by passing it over the end of the handle by a spiral movement until the outer end of the coil moves over the spiral grooves and small projection shown at the end of the handle. In order to remove the coil spring from the handle

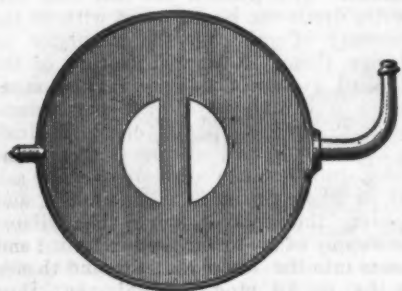


Graham Patent Vise Wrench.

bolt being forced backward a greater fulcrum is gained. The tool may be taken apart for sharpening, tempering, &c. The advantages of this vise wrench are alluded to as never crushing or splitting a pipe; that all the parts are interchangeable; that it will grip to the $\frac{1}{4}$ of an inch, and will take the shortest nipple out of any boiler without injury.

Devore's Stove Pipe Damper.

L. M. Devore, of Freeport, Ill., has just placed upon the market a stove pipe damper for which he makes many claims. It consists essentially of two parts, these being the plate with its curved handle as shown in Fig. 1, and the coiled spring inclosing the handle and pressing against the pipe, shown in Fig. 2. In Fig 3 is indicated the appearance of the damper when in position in the stove pipe, as well as the coil spring upon the curved handle of the damper. The tension of this spring



Devore's Stove Pipe Damper.—Fig. 1.—General View of Damper.

holds the damper at any desired angle, and at the same time the spring forms a non-heating surface which enables the damper to be operated without danger of burning the hand. The manufacturer directs attention to the fact that the handle is of such shape that it is easily in-

it is only necessary to compress it until its outer end passes into the groove, then turn the coil to the left, when it will easily slip off. After the spring has been removed from the handle the damper plate is sprung from the pipe at the small lug and then withdrawn. The manufacturer

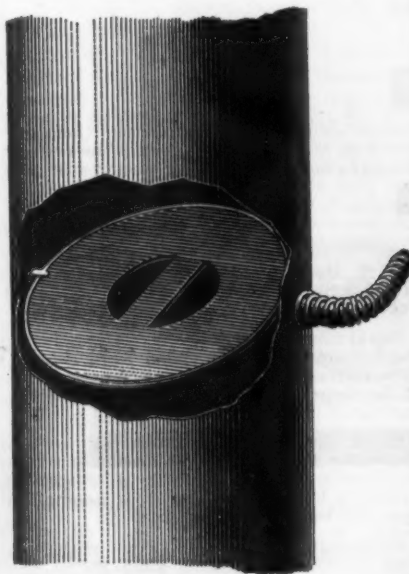


Fig. 3.—Showing Damper and Spring in Position.

has recently been allowed a patent broadly covering the spring and lug device for holding it in position.

The grand list of the State Comptroller is just out and shows the valuation of real estate, &c., in Connecticut. The date for reports to be handed in was October 1, 1889. On that date there were 10,611 mills, stores, distilleries and factories valued at \$53,491,093. The value of bank, insurance and manufacturing stock was

\$30,452,131; amount employed in mechanical and manufacturing operations, \$24,863,742.

Improved Coffee Pots.

The Cincinnati Stamping Company, of Cincinnati, Ohio, are offering the trade a line of coffee pots and boilers, two illus-



Improved Coffee Pots.—Fig. 1.—Side View of Coffee Pot.

trations of which we present in the accompanying engravings. These goods are made of XX Melyn tin plate and are offered in all regular sizes. The coffee pots are provided with the Jahant Patent Wooden Handle and Knobs to the lid, while the coffee boilers are fitted in the ordinary manner—that is, with metal handle and wooden bail. The goods are



Fig. 2.—General View of Coffee Boiler.

highly polished and present an appearance which, it is said, is equal to the finest nickel finish. Fig. 1 shows a side view of one of the coffee pots which the company are offering the trade, while Fig. 2 presents a general view of one of their new



Fig. 3.—Brand of Cincinnati Stamping Co.'s Coffee Pots.

boilers. These goods are placed upon the market under the company's guarantee, and branded to insure entire satisfaction. The brand is shown in Fig. 3 of the illustrations.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., June 3, 1890.

The Senate Committee on Finance have now fairly inaugurated their consideration of the House Tariff bill. They indulged in a little preliminary skirmishing on matters of routine as to the method of disposing of the subject. Senator Allison favored the preparation and report of a substitute, while Senator Sherman urged the consideration of the House bill as the basis of the committee work. The friends of Chairman McKinley are very desirous that the measure which will be finally adopted shall preserve substantially the features of the bill prepared under his direction. The chairman himself naturally feels that way, and his staunch Ohio friend in the Senate proposes to accommodate him if he can. Senator Sherman therefore promptly took a stand against the committee, starting out on the theory of putting the House bill aside and preparing an independent one to be acted upon by the Senate, leaving the final settlement to a committee of conference. There are no serious points of difference between the Houses of Congress. The House bill has excited some dissatisfaction on a few points among manufacturers, but these can be reconciled. The drafting and passage of a tariff bill in the House is always a matter of compromise as to the interests of localities.

In the discussion of the tariff bill in detail it is common for representatives of certain districts to vote against certain provisions in Committee of the Whole in order to place themselves in proper relation of deference to the wishes of their constituents, whereas upon the bill in its entirety they vote in the affirmative.

This is the position of the present House bill with regard to certain provisions, but as Senator Sherman said to the correspondent of *The Iron Age*, "The points of objection to the McKinley bill growing out of local interests are not of sufficient magnitude to make it easier to draft a new bill as a substitute. I can see no sufficient ground for any other course than to take the McKinley bill and amend it in conformity to the wishes of the parties in interest, provided the majority of the committee think best to do so. I shall not oppose amendment where the prevailing sentiment of the representative men of the interests involved are in favor of some modification, provided they demonstrate that their propositions will make the bill more acceptable to the industrial interests as a whole. It is to be hoped that the bill which will be passed by the present Congress will stand for some time, and that the agitations which are so injurious to industrial activity will cease for some years. The tariff bill under which the Government is now collecting its customs revenue has been in force for seven years. In these days of rapid inventive and commercial development tariff bills become obsolete, articles of manufacture are abandoned for improved productions and commercial designations change, so that revision in the schedules and items, as well as terms, are necessary.

"The object of the pending bill is to bring the tariff down to the latest date so that it may be good for a decade. It is important also that a bill should be passed by this Congress, as the two Houses and the Executive are in accord. The theory of the bill is based upon the American policy of protection. In the next Congress it may not be possible to pass such a bill. Should the House have an opposition majority the present law would have to stand, as the two parties are wide apart on the lines of tariff revision and tariff reform. I favor remaining until the tariff question is settled by the present Congress.

We will then take no chances in the eccentricities of political campaigns."

The views of Senator Sherman prevailed on the committee, and their deliberations are being conducted on the line of amendment rather than substitution.

The committee will grant hearings to parties who can show sufficient grounds for such a course. A large party of importers, representing various branches of importations, are here to give the committee the benefit of their views in opposition to the McKinley bill in certain lines of their business affected by the new schedule.

There is considerable opposition to the increase of the duty on tin plate, and the usual amount of clamor may be expected in reference to the increase of the price in that article. A distinguished member of the committee, who has been through the tariff battles of the past 30 years, said:

"As long as I have been familiar with the operations of the tariff, I have heard this free-trade cry of protective duties increasing prices, and many people are gulled by such clamor. If they will get some facts for themselves and not be run by the misrepresentations of interested parties, they will soon discover that the rule has been that protection has lowered prices. Steel rails are a notable example. First recall the price of rails when we were dependent upon the English manufacturers and what they are now when we have our own sources of supply. American rails in the American markets are cheaper than English rails in the English market. So I do not see that a protective duty of \$12 or \$17 a ton makes any difference. We simply keep our own markets for ourselves and get rails cheaper besides. The tin plate experience will be the same. As soon as this bill passes the foreign makers will put down prices to discourage our people from erecting plants. When our manufacturers enter the market the prices will come down still more, and home competition will settle the business. Let the people watch this and see how far the free-trade clamor of free tin plate *vs.* protected tin plate will work in the matter of price."

PERSONAL.

M. M. Duncan, for a number of years superintendent of the Roane Iron Company's furnaces at Rockwood, Tenn., has been appointed general manager of the Cardiff Coal and Iron Company, of Cardiff, Tenn. Mr. Duncan is a graduate of Lehigh University, and has established a high reputation as an iron manufacturer.

S. H. Harrington, chief mechanical engineer of the Erie Railroad Company, with headquarters at Susquehanna, Pa., has resigned.

Naval Constructor J. B. Hoover, on duty at the Portsmouth (N. H.) Navy Yard, will act as Government superintendent of construction at the Bath Iron Works, where are building gunboats 5 and 6.

D. R. Lean, the well-known engineer and contractor of Pittsburgh, accompanied by his son Ronald, left for the Pacific Slope last week on a business and pleasure trip combined. They will be absent about six weeks.

P. R. Dillon has been appointed superintendent of the Beaver Falls Mills of Carnegie, Phipps & Co., and J. A. Clark takes the position made vacant by Mr. Dillon's promotion.

Frank Rockefeller has been elected president of the Britton Iron and Steel Company, at Cleveland, Ohio, to succeed J. W. Britton, and S. A. Sague, formerly with the Lake Erie Iron Company, has been made general manager.

F. G. Tallman, for the past six years superintendent of the Beaver Falls Mills of Carnegie, Phipps & Co., Limited, formerly the Hartman Steel Company, Limited, has resigned his position, to take effect June 1.

H. D. Hibbard has resigned as manager of the Hainsworth Steel Company at Pittsburgh.

Joseph R. Skewis, assistant general manager of Carnegie, Phipps & Co.'s Homestead Mills, sailed on the 31st ult. for Europe.

Skewis will visit the blast furnace and rolling mill plants in the North of England, Wales and France, and the Krupp works at Essen, and will make a thorough study of their methods in the interest of his firm.

Mr. B. B. Paddock, the president of the Fort Worth Chamber of Commerce, in a recent address, set forth the importance of Texas in a striking manner. He said: "If an insurmountable and impenetrable wall were erected around Texas she could produce all the comforts and luxuries her people now enjoy. She could grow her own tropical fruits along the Gulf Coast, and freeze her own ice on her northern border. Her supply of timber is adequate to her demands, and she is sending thousands of carloads of merchantable lumber to Colorado and Kansas, and vast mines of the finest iron ore of the various kinds have been partially developed, and are only awaiting the advent of railroads to the mineral regions to enter the markets of the world as an active competitor in this branch of commerce. The only vein of manganese, without which steel cannot be made, of any importance on this continent, and the largest vein of this valuable metal in the world, exists in Texas. In copper, lead, kaolin, asbestos and other articles of similar and equally valuable nature she is equally rich.

CONTENTS.

Expanded Metal Machine. Illustrated.....	937
Basic Iron.....	939
New England Notes.....	939
Ammonia Pump. Illustrated.....	940
Eastern Miscellany.....	940
Double Acting Crank Power Press. Illus.....	941
Virginia Iron Notes.....	941
Disk Wheels with Direct Attached Engine. Illustrated.....	942
Fort Payne, Ala.....	943
The New Westinghouse Air Brake Company's Shops. Illustrated.....	944
New Publications.....	947
The Flow of Metals and Its Relation to Testing. Illustrated.....	948
The Week.....	950
Manufacturing: Iron and Steel, Machinery, Hardware, Miscellaneous.....	951-2
Editorials:	
The South on an Enduring Basis.....	953
Banking Methods.....	953
Iron Districts and Geographical Boundaries.....	954
Standards of Commercial Integrity.....	954
J. W. Sloss. Illustrated.....	955
The Basic Open Hearth Process.....	956
Trade Report: Chicago, Cincinnati, Detroit, Philadelphia, Chattanooga, Birmingham, Cleveland, St. Louis, Pittsburgh, New York, Financial, Metal Market, New York Metal Exchange, Coal Market, British Iron and Metal Markets.....	958-63
Hardware: The Condition of Trade, Barbed Wire, Wire Nails, Cut Nails, Miscellaneous Prices, Tacks, The Hardware Competitions, Countermarching Orders, Items, Price-List Holder, Travelers' Expenses, Price-Lists, Circulars, &c.....	964-8
Review of the Wholesale Market in Paints and Oils: Paints and Colors, Oils and Turpentine.....	970
Broncho Safety Bicycle. Illustrated.....	971
Junior Safety Rifles. Illustrated.....	971
Hatch Patent Bolt and Washer. Illustrated.....	971
Colton's Key Ring Screw Driver. Illus.....	972
The Lone Star Side Coffee Mill. Illustrated.....	972
Iron Age Cultivator, with Lever Adjustment. Illustrated.....	972
The Elkhart Lawn Sweeper. Illustrated.....	972
Wirt's All Iron Hose Reel. Illustrated.....	973
Jones' Patent Can Header. Illustrated.....	973
The Howard Improved Damper Regulator. Illustrated.....	973
The Graham Patent Vise Wrench. Illus.....	974
Devore's Stove Pipe Damper. Illustrated.....	974
Improved Coffee Pots. Illustrated.....	974
Washington News.....	975
Personal.....	975
Current Hardware Prices.....	976-81
Paints, Oils and Colors.....	981
Current Metal Prices.....	98

CURRENT HARDWARE PRICES.

JUNE 4, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.

Domestic..... \$ doz \$3.00, 33¢
Excelior..... \$ doz \$10.00, 50¢
Washburn's Self-Locking..... 30¢

Ammunition.—

Caps, Percussion, 1000—
Hicks & Goldmark's and Union Metallic
Cartridge Co.
F. L. Waterproof, 1-10's..... 34¢
E. B. Trimmer Edge, 1-10's..... 46¢
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 46¢
Musket Waterproof, 1-10's..... 50¢
G. D..... 28¢
S. B. Genuine Imported..... 45¢
Eley's E. B..... 54¢
Eley's D Waterproof, Central Fire..... \$1.60

Cartridges—

Rim Fire Cartridges..... 50¢
Rim Fire Military..... 15¢
Cent. Fire, Pistol and Rifle..... 25¢
Cent. Fire, Military and Sporting..... 15¢

Blank Cartridges, except 22 and 32 cal.,
additional 10% on above discounts.
Blank Cartridges, 22 cal., \$1.75..... 2¢
Blank Cartridges, 32 cal., \$3.50..... 2¢
Primed Shells and Bullets..... 15¢
B. B. Caps, Round Ball, \$1.75..... 2¢
B. B. Caps, Con. Ball, Swgd., \$2.00..... 2¢

Primers—

Berdan Primers, \$1.00..... 2¢
B. L. Caps (for Sturtevant Shells) \$1.00..... 2¢
All other Primers, \$1.20..... 2¢

Shells—

First quality, 4, 8, 10 and 12 gauge..... 25¢
First quality, 14, 16 and 20 gauge (\$10
list)..... 30¢
Star, Club, Rival and Climax brands..... 30¢
Selbold's Comb. Shot Shells..... 15¢
I. X. L. 10 and 12 gauge..... 40¢
"Special," 16 gauge..... 30¢
"Special," 10 and 12 gauge..... 40¢
Fowler's Pat..... \$3.25
Brass Shot Shells, 1st quality..... 60¢
Brass Shot Shells, Club, Rival, Climax..... 55¢

Shells Loaded—

Standard List..... 40¢
Wade—Price per M.
U. M. C. & W. R. A.—B. E., 11 up..... 68¢
U. M. C. & W. R. A.—B. E., 9 & 10..... 82¢
U. M. C. & W. R. A.—B. E., 8..... 96¢
U. M. C. & W. R. A.—B. E., 7..... \$1.10
U. M. C. & W. R. A.—P. E., 11 up..... 1.15
U. M. C. & W. R. A.—P. E., 9 & 10..... 1.50
U. M. C. & W. R. A.—P. E., 8..... 1.70
U. M. C. & W. R. A.—P. E., 7..... 1.80
Eley's B. E., 11 up..... \$1.75
Eley's P. E., 11 up..... 2.80

Anvils.—

Eagle Anvils, 10¢..... 15¢
Peter Wright's..... 10¢
Armstrong's Mouse Hole..... 9¢
Armstrong's Mouse Hole, Extra..... 11¢
Trenton..... 8¢
Wilkinson's..... 9¢
J. & Riley Carr, Pat. Solid..... 11¢
Moore & Barnes Mfg. Co..... 33¢

Anvil Vise and Drill—

Millers Falls Co., \$18.00..... 20¢
Cheney Anvil and Vise..... 25¢
Allen Anvil and Vise, \$3.00..... 40¢
Star..... 45¢

Apple Parers—See Parers, Apple.

Augers and Bits—

Douglas Mfg. Co..... 70¢
Wm. A. Ives & Co..... 70¢
Humphreysville Mfg. Co..... 70¢
French, Swift & Co. (F. H. Beecher,
P. S. & W. Co.)..... 70¢
Rockford Bit Company..... 70¢
Cook's, Douglas Mfg. Co..... 55¢
Cook's, N. H. Copper Co. 50¢
Ives' Circular Lip..... 60¢
Patent Solid Head..... 30¢
C. E. Jennings & Co., No. 10, extension
up..... 60¢
C. E. Jennings & Co., No. 30..... 60¢
C. E. Jennings & Co., Auger Bits, 1/2
set, 22¢
Lewis' Patent Single Twist..... 45¢
Russell Jennings' Augers and Bits..... 25¢
Imitation Jennings' Bits..... 60¢
Snell's Jennings' Pattern..... 60¢
Pugh's Black..... 60¢
Rockford, Jennings' Pattern..... 60¢
Car Bits..... 60¢
Car Bits, P. S. & W. Co..... 60¢
Snell's Car Bits..... 60¢
L. Hommedieu Car Bits..... 15¢
Foster's Pat. Auger Bits..... 10¢
Cincinnati Bell-Hangers' Bits..... 30¢

Bit Drill—

Morse Twist Drills..... 50¢
Standard..... 50¢
Cleveland..... 50¢
Syracuse, for metal..... 50¢
Syracuse, for wood (wood list) 30¢
Williams' or Holt's, for metal 50¢
Williams' or Holt's, for wood..... 40¢
Cincinnati, for wood..... 30¢
Cincinnati, for metal..... 40¢

Expansive Bits—

Clark's small, \$18; large, \$26..... 35¢
Ives' No. 4, \$ doz \$10..... 40¢
Swan's..... 40¢
Steer's, No. 1, \$30; No. 2, \$22..... 35¢
Stearns' No. 2, \$48..... 20¢

Gimlet Bits—

Common..... \$ gross \$2.75, \$3.25
Diamond..... \$ doz \$1.10..... 25¢
Bee..... 25¢
Double Cut Shepardson's..... 45¢

Double Cut, Ct. Valley Mfg. Co..... 30¢
Double Cut, Hartwell's, \$ gro..... 35¢
Double Cut, Douglas..... 40¢
Double Cut, Ives..... 60¢

Hollow Augers—

Ives..... 33¢
French, Swift & Co..... 33¢
Bonney's Adjustable..... 40¢
Stearns..... 30¢
Ives' Expansive, each \$4.50..... 50¢
Universal Expansive, each \$4.50..... 50¢
Wood's..... 25¢
Cincinnati Adjustable..... 30¢
Cincinnati Standard..... 25¢

Ship Augers and Bits—

L. Hommedieu's..... 15¢
Watrous..... 15¢
Snell's..... 15¢
Snell's Ship Auger Pat'n Car Bits..... 15¢

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common..... \$ gr \$1.70, 35¢
Awls, Should. Peg, \$ gr \$2.45, 40¢
Awls, Pat. Peg, \$ gr \$2.45, 40¢
Awls, Shouldered Brad, 2.70 \$ gr..... 35¢
Awls, Handled Brad, \$7.50 \$ gr..... 45¢
Awls, Handled Scratch \$ gr, \$7.50 35¢
Awls, Socket Scratch, \$ doz, \$1.50 25¢

Awl and Tool Sets—See Sets, Awl

And Tool.

Axes—

Plain, Beveled..... \$8.00, \$8.50
Others..... 7.50, 8.00
Note.—Jobbers often sell at lower prices than the above.

Axle Grease—See Grease, Axle.

Axles—

No. 1, 4¢ @ 5¢, No. 2, 5¢ @ 6¢
Nos. 7 to 14..... 55¢
Nos. 15 to 18..... 47¢
Nos. 19 to 22..... 70¢
National Tugger Self-Clng. Standard
Farm (1 to 5) and Special Farm (A1
to A5):
Less than 10 sets..... 33¢
Over 10 sets..... 33¢

Bag Holders.—See Holders, Bag.

Balances—

Spring Balances..... 40¢
Chatillon, \$ doz..... \$0.80, 0.95, 1.75 net
Chatillon Straight Balances..... 40¢
Chatillon Circular Balances..... 50¢

Bars.

Crow—
Cast Steel..... \$ 41¢
Iron, Steel Points..... \$ 34¢

Basins, Wash—

Standard Fiberglass, No. 1, 10½-Inch, 32;
12-Inch, \$2.25; 13½-Inch, \$2.75; 15-Inch,
\$3.25.

Beams, Scale—

Scale Beams, List Jan. 12, '89..... 50¢
Chatillon's No. 1..... 40¢
Chatillon's No. 2..... 50¢

Beaters, Egg, &c—

Keystone, P. D. & C., Each No. 1, \$1; No.
2, \$2..... 20¢
Dover..... \$ doz \$1.50
National, \$ doz \$4.50..... 35¢
Family (T. & S. Mfg. Co.), \$ gro \$17.00

Duplex (Standard Co.)..... \$ doz \$1.25

Rival (Standard Co.)..... \$ doz \$1.00
Duplex Extra Heavy (Standard Co.)..... \$ doz \$3.00

Triumph (T. & S. Mfg. Co.), \$ gro \$10.50

Advance, No. 1..... \$11.50
Advance, No. 2..... \$10.50
Bryant's..... \$ gro \$14.00
Ayres' Spiral..... \$ gro \$5.00
Double (H. & R. Mfg. Co.)..... \$ gro \$16.20
Easy (H. & R. Mfg. Co.)..... \$ gro \$14.00
Triple (H. & R. Mfg. Co.)..... \$ gro \$16.20
Spiral (H. & R. Mfg. Co.)..... \$ gro \$4.50
Faine, Diehl & Co.'s..... \$ gro \$24.00

Bells—

Cow—

Common Wrought..... 60¢
Western..... 20¢
Western, Sargent's list..... 70¢
Kentucky, "Star"..... 20¢
Kentucky, Sargent's list..... 70¢
Dodge, Genuine Kentucky..... 70¢
Texas Star..... 50¢
Call..... 40¢
Farm Bells..... \$ 36¢
Steel Alloy Church and School Bells..... 40¢

Door—

Gong, Yankee..... 39¢
Gong, Barton's..... 40¢
Crank, Taylor's..... 25¢
Crank, Brooks'..... 50¢
Crank, Cone's..... 10¢
Crank, Connel's..... 20¢
Lever, Sargent's..... 60¢
Lever, Taylor's Bronzed or Plated..... net
Lever, R. E. M. Co.'s..... 50¢
Pull, Brook's..... 50¢
Pull, Western..... 25¢

Electric.

Wollensak's..... 20¢
Bigelow & Dowse..... 20¢
Taylor's..... 20¢

Hand—

Light Brass..... 75¢
Extra Heavy..... 65¢

White Metal..... 60¢
Silver China..... 35¢
Globe (Cone's Patent)..... 25¢

Bellows—

Blacksmiths..... 60¢
Molders..... 40¢
Hand Bellows..... 40¢

Belt, Rubber—

Common Standard..... 70¢
Standard..... 60¢
Extra..... 60¢
N. Y. B. & P. Co., Carbon..... 50¢
N. Y. B. & P. Co., Diamond..... 40¢

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire.

Stoddard's Lightning Tire Upsetters..... 15¢
Detroit Perfected Tire Bender..... 15¢

Bits—

Auger, Gimlet, Bit Stock, Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders, Bit.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Ordinary Tackle, list May 20, 1889..... 50¢
Cleveland Block Co., Mal. Iron..... 50¢
Moore's Novelty, Mal. Iron..... 50¢

Boils—

Carriage, Machine, &c.—
Com. list June 10, '84..... 70¢
Genuine Eagle, list Oct. '84..... 75¢
Phin. pattern, list Oct. '84..... 80¢
R. B. & W., old list..... 70¢
Machine, list Jan. 1, 1890..... 75¢
Bolt Ends, list Jan. 1, 1890..... 75¢

Door and Shutter—

Cast Iron Barrel, Square, &c..... 70¢
Cast Iron Shutter Bolts..... 70¢
Cast Iron Chain (Sargent's list)..... 65¢
Ives' Patent Door Bolts..... 70¢
Wrought Barrel..... 70¢
Wrought Square..... 70¢
Wrt Shutter, all Iron, Stanley's..... 60¢
Wrt Shutter, Brass Knob..... 40¢
Wrt Shutter, Sargent's list..... 60¢
Wrt Sunk Flush, Sargent's list..... 55¢
Wrt Sunk Flush, Stanley's list..... 50¢
Wrt B.K. Flush, Com'n..... 55¢

Stove and Plow—

Stove..... 60¢
Plow..... 60¢
R. B. & W., Plow..... 55¢

Tire.

Common, list Feb. 28, '83..... 65¢
Port Chester Bolt and Nut Company..... 65¢
Empire, list Feb. 28, '83..... 65¢
Keystone, Philadel., list Oct. '84..... 50¢
Norway, Phila., list Oct. '84..... 70¢
American Screw Company..... 75¢
Norway, Phil., list Oct. 16, '84..... 80¢
Phila., list Oct. 16, '84..... 80¢
Bay State, list Feb. 28, '83..... 65¢
R. B. & W., Philadel., list Oct. 16, '84..... 80¢

Borers, Tap.

Common and Hind..... 20¢
Ives' Tap Borer..... 33¢
Enterprise Mfg. Co..... 20¢
Clark's..... 35¢
Borax..... \$ 9¢
Boring Machines—See Machines, Boring.

Box Pins—See Pins, Box.

Boxes, Wagon.

Per b..... 2¢

Braces—

American Bit Brace Co.:
Nos. 10, 12, 20..... 60¢
Nos. 11, 21, 24, 27..... 70¢
Nos. 22, 23, 25..... 70¢
Ball Braces, net..... \$1.12 to \$1.25

Amidon's

Barker's Imp'd Plain..... 75¢
Barker's Imp. Nickle..... 65¢
Ratchet..... 75¢
Eclipse Ratchet..... 10¢
Globe Jawed..... 40¢
Corner Brace..... 40¢
Universal, 8 in., \$2.10 10 in..... \$2.25
Buffalo Ball..... \$1.10 \$1.15

Barber's

Nos. 10 to 16..... 60¢
Nos. 30 to 33..... 60¢
Nos. 40 to 63..... 50¢
Barker's..... 75¢
Nos. 8, 10 and 12..... 75¢
Plated, Nos. 8, 10 and 12..... 65¢
Bartholomew's..... 50¢
Nos. 25, 27 and 30..... 50¢
Nos. 117, 118, 119..... 70¢
Common Ball, American..... \$1.00 \$1.10
Fray's Genuine Spofford's..... 50¢
Fray's No. 70 to 120, 81 to 123, 207 to 414..... 50¢

Ives' New Haven Novelty..... 70¢

New Haven Ratchet..... 60¢
Barber Ratchet..... 60¢
Spofford..... 60¢
Osmond's Ratchet..... 40¢
P. S. & W. Co., Peck's Patent..... 60¢

Brackets—

Shelf plain, Sargent's list, 55¢
Shelf, fancy, Sargent's list, 60¢
Reading, plain..... 50¢
Reading, Rosette..... 60¢

Bright Wire Goods—See Wire.

Broilers—

Remis' Self-Inch..... 9 10 9x11
Basting..... \$4.50 5 6.50

Buckets, Well.

Galvanized—

Hill's..... \$ doz, 12 qt, \$4.25; 14 qt, \$5.25
Iron Clad..... \$ doz, 14 qt, \$4.25 \$4.50
Whiting's Flat Iron Band..... \$4.25 \$4.50
Whiting's Wired Top..... \$ doz \$4.00 \$4.25

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers Butchers'.

Butts—

Brass—
Wrought Brass..... 75¢
Cast Brass, Tiebout's..... 50¢
Cast Brass, Corbin's, Fast..... 35¢
Cast Brass, Loose Joint..... 35¢

Cast Iron—

Fast Joint, Narrow..... 50¢
Fast Joint, Broad..... 50¢
Loose Joint..... 70¢
Loose Joint, Japanned..... 70¢
Loose Joint, Jap. with Acorns..... 70¢
Parliament Butts..... 70¢
Mayer's Hinges..... 70¢
Loose Pin, Acorns..... 70¢
Loose Pin, Acorns, Japanned..... 70¢
Loose Pin, Acorns, Japanned, Plated Tips..... 70¢

Wrought Steel—

Fast Joint, Narrow..... 50¢
Fast Joint, Lt. Narrow..... 50¢
Fast Joint, Broad..... 70¢
Loose Joint, Broad..... 70¢
Table Butts, Back Flaps, &c..... 70¢
Inside Blind, Regular..... 70¢
Inside Blind, Light..... 70¢
Loose Pin..... 50¢
Bronzed Wrought Butts..... 50¢

Calipers—See Compasses.

Calks, Tee—

Gautier..... \$ 5¢
Dewicks (Burke)..... \$ 5¢

Can Openers—See Openers, Can.

Cards—

Horse & Curry..... 10¢
Cotton..... 10¢
Wool..... 10¢

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—See Ammunition.

Casters—

Bed..... 55¢
Plate..... 60¢
Shallow Socket..... 40¢
Deep Socket..... 40¢
Yale Casters, list May, 1884..... 30¢
Yale, Gem..... 60¢
Martin's Patent (Phoenix)..... 45¢
Payson's Anti-friction..... 60¢
Giant Truck Casters..... 50¢
Stationary Truck Casters..... 50¢
Socket Truck Casters..... 50¢

Cattle Leaders—See Leaders, Cattle.

Chain—

Trace, Wagon and Fancy Chains,
List revised April 21, 1890..... 50¢
American Coll. in cask lots,
3-16 3-16 3-16 3-16 3-16 3-16
\$8.00 5.70 4.80 4.30 3.90 3.75 3.65 3.55
Less than cask lots, add 1¢
German Coll. list of June 20, 1887..... 50¢

German Halter Chain, list of June 20, 1887..... 50¢

Covert Halter..... 50¢
Covert Traces..... 50¢
Covert Heel Chain..... 50¢
Onelda Halter Chain..... 60¢
Galvanized Pump Chain..... 75¢
Jack Chain, Iron..... 75¢
Jack Chain, Brass..... 75¢

Chalk—

White..... \$ gr 50¢
Red..... \$ gr 70¢
Blue..... \$ gr 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—

Socket Framing and Firmer.
P. S. & W..... 75¢
New Haven..... 75¢
Wetherby..... 75¢
Ohio Tool Co..... 75¢
Douglas..... 75¢
Buck Bros..... 30¢
Merrill..... 60¢
L. & I. J. White..... 30¢

Tanged and Miscellaneous.

Tanged Firmers..... 40¢
Butchers'..... \$4.75
Spear & Jackson's..... \$5 to \$6
Buck Bros..... 30¢
Cold Chisels..... 15¢

Chucks—

Beach Pat.	each, \$5.00	20%
Morse's Adjustable, each	\$7.00, 50¢	20%
Oambury	each, \$4.00, 50¢	20%
Ayracuse, Bala Pat.		25%
Skinner's Pat. Drill Chucks		40%
Skinner's Independent Lathe Chucks		40%
Skinner's Pat. Comb. Chuck		40%
Union Mfg. Co.		40%
Victor		25%
Combination	\$3.50	25%
Universal		40%
Independent		40%

Churns.

Tiffin Union No. 1, 5 gallon	\$3.25 each
Tiffin Union No. 2, 7 gallon	\$3.75 each
Tiffin Union No. 3, 10 gallon	\$4.25 each

Clamps—

R. I. Tool Co.'s Wrought Iron	25%
Adjustable, Cincinnati	15%
Adjustable, Hammer	15%
Adjustable, Steam	30%
Steam's Adjustable Cabinet and Corner	30%
Cabinet, Sargent's	30%
Carriage Makers', Sargent's	70%
Carriage Makers', P. S. & W. Co.	40%
Eberhard Mfg. Co.	40%
Saw Clamps, see Yues, Saw Filers	
Carpenters', Cincinnati	15%

Cleavers.

Butchers'	
Bradley's	25%
L. & J. White	20%
Beatty's	40%
New Haven Edge Tool Co.'s	40%
P. S. & W.	35%
Foster Bros.	40%
Schultz, Lohoff & Co.	40%

Clips—

Norway Axle, 1/4 & 5-16	55%
2nd grade Norway Axle, 1/4 & 5-16	65%
Superior Axle Clips	60%
Norway Spring Bar Clips, 5-16	60%
Wrought-Iron Felloe Clips	55%
Steel Felloe Clips	55%
Baker Axle Clips	55%

Cloth and Netting, Wire—See Wire, &c.**Cockeyes.**

Cocks, Brass	50%
--------------	-----

Coffee Mills—See Mills, Coffee.**Collars, Dog, &c.**

Medford Fancy Goods Co.	40%
Embossed, Gift, Pope & Steven	30%
Leather, Pope & Steven's list	40%
Brass, Pope & Steven's list	40%
Chapman Mfg. Company	50%

Combs, Curry.

Fitch's	50%
Rubber, per doz \$10.00	20%
Perfect	50%

Compasses, Dividers, &c.—

Compasses, Callipers, Dividers	70%
Bemis & Call Co.'s	
Dividers	60%
Compasses & Callipers	50%
Wing and Inside or Outside	50%
Double	50%
(Call's Pat. Inside)	30%
Excelsior	50%
J. Stevens & Co.'s	25%
Starrett's	
Spring Callipers and Dividers	25%
Lock Callipers and Dividers	25%
Combination Dividers	25%

Coopers' Tools—See Tools, Coopers'.**Cord, Sash—**

Common	\$ 10 @ 11¢
Patent, good quality	\$ 13 @ 13¢
White Cotton Braided, fair	\$ 28 @ 28¢
Common Russia Sash	\$ 13 @ 13¢
Patent	\$ 15 @ 15¢
Cable Laid Italian Sash	\$ 22 @ 22¢
Indian Cable Laid	\$ 13 @ 13¢
Silver Lake	
A Quality, White, 50¢	10¢ @ 10¢
A Quality, Drab, 55¢	10¢ @ 10¢
B Quality, White, 50¢	28¢ @ 28¢
B Quality, Drab, 55¢	31¢ @ 31¢
C Quality, White only	26¢ @ 26¢
Sylvan Spring, Extra Braided, White, 34¢	
Sylvan Spring, Extra Braided, Drab, 34¢	
Semper Idem, Braided, White	30¢
Egyptian, India Hemp, Braided	25¢
Samson	
Braided, White Cotton, 50¢	30¢ @ 30¢
Braided, Drab Cotton, 55¢	30¢ @ 30¢
Braided, Italian Hemp, 55¢	30¢ @ 30¢
Braided, Linen, 80¢	30¢ @ 30¢

Corkscrews—See Screws, Cork.**Corn Knives and Cutters—See Knives, Corn.****Crackers, Nut—**

Table (H. & B. Mfg. Co.)	40%
Blake's Patent	\$ dos \$2.00, 10¢
Turner & Seymour Mfg. Co.	50%

Cradles—

Grain	50%
-------	-----

Crayons.

White Crayons, # gr. 12¢ @ 12¢	10%
D. M. Stewart Mfg. Co., Metal Work	25%
crs., # gr. \$2.50	25%
M. Stewart Mfg. Co., Rolling Mill	25%
# gr. \$2.50	25%
See also Chalk	

Crow Bars—See Bars, Crow.**Curry Combs—See Combs, Curry.****Curtain Pins—See Pins, Curtain.****Cutters—****Meat.**

Dixon's # dos	40%
Nos.	1 2 3 4
	\$1.00 \$1.70 \$1.90 \$2.00

Woodruff's # dos

Nos.	100 150
	\$15.00 \$20.00

Hales Pattern # dos

Nos.	11 12 13
	\$27.00 \$35.00 \$45.00

American

Nos.	1 2 3 4 5
Each	\$5 \$7 \$10 \$25 \$50

Enterprise

Nos.	10 12 22 32 42
Each	\$3 \$2.50 \$4 \$5 \$15

Pennsylvania

Nos.	1 2 3 00
# dos	\$24.00 \$25.00 \$36.00 \$28.00

Miles' Challenge # dos

Nos.	1 2 3
# dos	\$22.00 \$30.00 \$40.00

Home No. 1

Draw Cut, each:	
Nos.	5 2 6 8
	\$50 \$75 \$90 \$225

Beef Shavers (Enterprise)

Little Giant	50%
--------------	-----

Chadborn's Smoked Beef Cutter, # dos

	\$60.00
--	---------

Tobacco

Champion	20%
Wood Bottom	\$ dos \$5.00 @ \$5.25
All Iron	\$ dos \$2.25

Nashua Lock Co.'s # dos

Wilson's	\$ dos \$24.00 \$25.00
Sargent's	\$ dos \$20.00, 40%

Washer

Smith's Pat.	\$ dos \$12.00, 20% @ 10%
Johnson's	\$ dos \$11.00, 30%

Penny's # dos Pol. #14

Appleton's	\$ dos \$16.00, 55%
Bonney's	\$ dos \$16.00, 55%
Cincinnati	25%

Cutlery—

Beaver Falls & Booth's	35%
Wostenholme	\$7.75 to 2

Dampers, &c—

Dampers, Buffalo	40%
Buffalo Damper Clips	40%
Crown Damper	40%
Excelsior	40%

Diggers, Post Hole, &c—

Samson Post Hole Digger, # dos	\$36.00
Fletcher Post Hole Augers, # dos	\$36.00

Eureka Diggers

Leed's	\$ dos \$16.00 @ \$17.00
Vaughan's Post Hole Auger, # dos	\$13.00 @ \$14.00

Kohler's Little Giant

Kohler's Hercules	\$ dos \$18.00
Kohler's New Champion	\$ dos \$9.00

Schneider

Ryan's Post Hole Diggers, # dos	\$24.00
Cronk's Post Bars, # dos	\$60.00

Gibbs Post Hole Digger, # dos

Imperial, # dos	\$16.00, 55%
-----------------	--------------

Dividers—

See Compasses.	
----------------	--

Dog Collars—See Collars, Dog, &c.**Door Springs—See Springs, Door.****Drawers.**

Money, # dos	\$18 @ \$20
--------------	-------------

Drawing Knives—See Knives, Drawing.**Drills and Drill Stocks—**

Blacksmiths' Self-Feeding, each	\$7.50, 20%
Breast, P. S. & W.	40%

Breast, Millers Falls

Breast, Bartholomew's	each \$2.50
Ratchet, Merrill's	25% @ 40%

Ratchet, Ingersoll's

Ratchet, Parker's	30% @ 20%
Ratchet, Whitney's	30% @ 20%

Ratchet, Weston's

Ratchet, Moore's Triple Action	25% @ 30%
Ratchet, Curtis & Curtis	30%

Whitney's Hand Drill, Plain

Adjustable, \$12.00	30%
---------------------	-----

Wilson's Drill Stocks

Automatic Boring Tools	\$1.75 @ \$1.85
------------------------	-----------------

Twist Drills

Morse	50% @ 10%
-------	-----------

Standard

Syracuse (Metal list)	50% @ 10%
-----------------------	-----------

Cleveland

Williams	50% @ 10%
----------	-----------

New Process

	50% @ 10%
--	-----------

Drill Bits—See Augers and Bits.**Drill Chucks—See Chucks.****Dripping Pans—See Pans, Dripping.****Drivers, Screw.**

Douglas Mfg. Co.	20% @ 10%
------------------	-----------

Disston's

Disston's Pat. Excelsior	45% @ 10%
--------------------------	-----------

Buck Bros.

Stanley R. & L. Co.	30%
---------------------	-----

Varnished Handles

Black Handles	60% @ 10%
---------------	-----------

Sargent & Co's

No. 1 Forged Blade	60% @ 10%
--------------------	-----------

Nos. 20, 30 and 60

P. S. & W.	60% @ 10%
------------	-----------

Knapp & Cowles No. 1

No. 1 Extra	60% @ 10%
-------------	-----------

Nos. 00 & 4

Stearns	25% @ 10%
---------	-----------

Gay & Parsons

Champion	25% @ 10%
----------	-----------

Clark's Pat.

Crawford's Adjustable	30% @ 10%
-----------------------	-----------

Ellrich's Socket and Ratchet

Allard's Spiral, new list	25%
---------------------------	-----

Kolb's Common Sense # dos

Syracuse Screw-Driver Bits	30% @ 10%
----------------------------	-----------

Screw-Driver Bits

	\$ dos 50¢ @ 75¢
--	------------------

Screw-Driver Bits, Parr's

Fray's Hol. Hdl. Sets, No. 3	\$14.00
------------------------------	---------

P. D. & Co's all Steel

Cincinnati	20% @ 10%
Brace Screw Drivers	25% @ 10%

Buck Bros' Screw-Driver Bits

	25% @ 10%
--	-----------

Egg Beaters—See Beaters, Egg.**Egg Poachers—See Poachers, Egg.****Electric Bell Sets—See Bells, Electric.****Emery. — No. 4 to No. 54 to Flour, OF**

Kegs, # 2	46 gr. 150 gr. F. FF.
24 kegs, # 2	46 gr. 150 gr. F. FF.
24 kegs, # 2	46 gr. 150 gr. F. FF.

10-b cans, 10

in case	6 6 6 5 5
10-b cans, less than 10	10 10 10 7 7

Framed and Tinned Ware—See Ware, Hollow.**Escutcheon Pins—See Pins, Escutcheon.****Escutcheons.****Door Lock—Same dis as Door Locks.****Brass Thread**

Wood	60% @ 10%
------	-----------

Fasteners, Blind—

Mackrell's # dos	\$1.00, 20% @ 10%
Van Sand's Screw Pat.	\$15 gr. 60% @ 10%

Van Sand's Old Pat.

Washburn's Old Pattern, # gr.	\$9.00
-------------------------------	--------

Merriman's

Austin & Eddy No. 2008 # gr.	\$9.00
------------------------------	--------

Security Gravity, # gr.

	\$9.00
--	--------

Faucets.—

Fenn's	40%
Bohren's Pat. Rubber Ball	25%

Fenn's Cork Stops

Star	35%
------	-----

Frary's Pat. Petroleum

B. & L. B. Co.	40%
----------------	-----

West's Lock, Open and Shut Key

Star, Metal Plug, new list	40%
----------------------------	-----

Lockport, Metal Plug, reduced list

Metallic Key, Leather Lined	60% @ 10%
-----------------------------	-----------

Cork Lined

Burnside's Red Cedar	50%
----------------------	-----

Burnside's Red Cedar, dbl lot

John Sommers	50%
--------------	-----

Peerless Best Block Tin Key

EXL, 1st quality, Cork Lined	40%
------------------------------	-----

Diamond Lock

Perfection, Fla. Red Cedar	50%
----------------------------	-----

Goodenough Cedar

Roggin's Latches..... \$ doz 30¢@35¢
 Bronze Iron Drop Latches..... \$ doz 70¢ net
 Jan'd Store Door Handles—Nuts, \$1.02;
 Plate, \$1.10; no Plate, \$0.88..... net
 Barn Door, \$ doz \$1.40..... 10¢10¢
 Chest and Lifting..... 70¢

Wood—

Saw and Plane..... 40¢10¢@40¢10¢5¢
 Hammer, Hatchet, Axe, Sledge, &c., 40¢
 Brad Axl..... \$ gr 22.00
 Hickory Firmer Chisel, ass'd., \$ gr 4.50
 Hickory Firmer Chisel, large, \$ gr 5.00
 Apple Firmer Chisel, ass'd., \$ gr 5.00
 Apple Firmer Chisel, large, \$ gr 5.00
 Socket Firmer Chisel, ass'd., \$ gr 5.00
 Socket Framing Chisel, ass'd., \$ gr 5.00
 J. S. Smith & Co.'s Pat File..... 50
 File, assorted..... \$ gr 75¢ 40¢
 Auger, assorted..... \$ gr 5.00 40¢10¢
 Auger, large..... \$ gr 7.00 40¢10¢
 Pat. Auger, Ives'..... 30¢10¢
 Pat. Auger, Douglas..... \$ set \$1.20
 Pat. Auger, Swan's..... \$ set \$1.20
 Hoe, Rake, Shovel, &c..... 50¢75¢

Hangers—

Barn Door, old patterns..... 60¢10¢10¢70¢
 Barn Door, New England..... 60¢10¢10¢70¢
 Sampson Steel Anti-Friction..... 55¢
 Orleans Steel..... 55¢
 Hamilton Wrought Wood Track..... 55¢
 U. S. Wood Track..... 65¢
 Champion..... 60¢10¢
 Rider and Wooster, Medina Mfg. Co.'s
 List..... 70¢
 Climax Anti-Friction..... 60¢
 Climax Anti-Friction for Wood Track 65¢
 Zenith for Wood Track..... 55¢
 Reed's Steel Arm..... 50¢
 Challenge, Barn Door..... 50¢
 Sterling's Improved (Anti-Friction) 10¢10¢
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3,
 \$18.00..... 50¢25¢
 Cheritree..... 50¢10¢
 Kidder's..... 60¢10¢60¢
 The Boss..... 60¢10¢
 Best Anti-Friction..... 60¢10¢
 Duplex (Wood Track)..... 60¢10¢5¢
 Terry's Pat., \$ doz pr. 4 in, \$10.00; 5 in,
 \$12.00..... 50¢10¢
 Terry's Steel Anti-Friction Leader 50¢10¢
 Terry's Steel Anti-Friction Ideal 50¢10¢
 Cronk's Patent, Steel Covered..... 60¢5¢
 Wood Track Iron Clad, \$ ft. 10¢..... 50¢
 \$15¢60¢

Carrier Steel Anti-Friction..... 50¢50¢5¢
 Architect, \$ set \$6.00..... 20¢
 Eclipse..... 30¢10¢
 Felix, \$ set \$4.50..... 20¢
 Richards..... 30¢30¢10¢
 Lane's Standard..... 50¢5¢50¢10¢
 Lane's New Standard..... 50¢5¢50¢10¢
 Ball Bearing Door Hanger..... 20¢10¢25¢10¢
 Warner's Pat..... 20¢10¢20¢10¢10¢
 Stearns' Anti-Friction 20¢10¢20¢10¢10¢
 Stearns' Challenge..... 25¢10¢25¢10¢10¢
 Faultless..... 40¢40¢5¢
 American, \$ set \$6.00..... 20¢10¢
 Rider & Wooster, No. 1, 62¢; No. 2,
 75¢..... 40¢
 Paragon, No. 1, 2 and 3 in..... 25¢10¢
 Cincinnati..... 25¢10¢
 Paragon, Nos. 5, 5½, 7 and 8..... 20¢10¢
 Crescent..... 60¢60¢10¢
 Nickel Cast Iron..... 50¢
 Nickel, Malleable Iron and Steel..... 40¢
 Scranton Anti-Friction Single Strap 35¢
 Wild West, 4 in. Wheel, \$15.00; 5 in.,
 \$21.00..... 40¢10¢40¢10¢5¢
 Star..... 50¢5¢50¢10¢
 May..... 50¢5¢50¢10¢
 Barry, \$6.00..... 40¢10¢

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co.
 Bloo's.....
 Hunt's.....
 Hurd's.....
 Mann's.....
 Peck's.....
 Underhill's..... 40¢ & 10¢
 Buffalo Hammer Co.....
 Fayette R. Plumb..... 50¢5¢
 C. Hammond & Son.....
 Sargent & Co.....
 P. S. & W. Co.....
 Ten Eyck Edge Tool Co.....
 Collins..... 50¢10¢
 Schulte, Lohoff & Co..... 50¢50¢5¢

Hay and Straw Knives—See

Knives.

Hinges—

Blind Hinges—
 Parker..... 75¢2¢
 Palmer..... 60¢5¢10¢
 Seymour..... 70¢5¢
 Nicholson..... 45¢10¢
 Huffer..... 50¢
 Clark's, Nos. 1, 3, 5, 40 and 50..... 75¢10¢5¢80¢
 Clark's Mortise Gravity..... 50¢
 Sargent's, Nos. 1, 3, 5, 11, 13..... 75¢10¢55¢10¢5¢
 Sargent's, No. 12..... 75¢10¢
 Reading's Gravity..... 75¢10¢75¢10¢5¢
 Shepard's.....
 Noiseless..... 75¢10¢
 Niagara..... 80¢
 Buffalo..... 80¢
 Clark's Genuine Pattern..... 80¢
 O. S. Lull & Porter..... 75¢10¢
 Acme, Lull & Porter..... 75¢
 Queen City Reversible..... 70¢10¢50¢75¢
 Clark's Lull & Porter, Nos. 0, 1, 1½,
 2, 2½, 3..... 75¢10¢2¢4¢
 North's Automatic Blind Fixtures, No. 2,
 for Wood, \$10.50; No. 3, for Brick,
 \$13.50..... 35¢2¢
 Gate Hinges—
 Western..... \$ doz \$4.40, 80¢
 N. E..... \$ doz \$7.00, 55¢
 N. E. Reversible..... \$ doz \$6.20, 55¢10¢
 Clark's, Nos. 1, 2, 3..... 60¢10¢5¢
 N. Y. State..... \$ doz \$5.00, 55¢10¢
 Automatic..... \$ doz \$12.50, 50¢
 Common Sense..... \$ doz pair \$4.50, 50¢
 Seymour's..... 45¢10¢
 Shepard's..... 60¢10¢5¢
 Reed's Latch and Hinges..... \$ doz \$12.00, 50¢

Spring Hinges—

Geer's Spring and Blank Butts..... 40¢
 Union Spring Hinge Co.'s Hat, March,
 1888..... 20¢

Acme..... 30¢
 J. S..... 25¢10¢
 Empire and Crown..... 20¢
 Hero and Monarch..... 55¢
 American, Gem, and Star..... 20¢
 Oxford..... 20¢
 Barker's Double Acting..... 30¢10¢
 Union Mfg. Co..... 25¢
 Sommer's..... 30¢
 Juckman's..... 15¢20¢
 Chicago..... 30¢
 Wiles..... 10¢
 Devore's..... 40¢
 Rex..... 40¢
 Royal..... 60¢
 Reliable..... 60¢
 Champion..... 60¢
 Bardsley's Patent..... 40¢
 Stearn's..... 50¢10¢

Wrought Iron Hinges

Strap and T..... 70¢10¢
 Screw Hook and Strap..... 6 to 12 in., \$ 4.2-10¢
 14 to 20 in., \$ 3.7-10¢
 22 to 36 in., \$ 3.2-10¢
 Heavy Welded..... 6 to 12 in., \$ 4.2-10¢
 14 to 20 in., \$ 3.7-10¢
 22 to 36 in., \$ 3.2-10¢
 Screw Hook..... ¼ in., \$ doz \$1.50
 and Eye..... ½ in., \$ doz \$2.45 10¢
 ¾ in., \$ doz \$3.80
 Rolled Blind Hinges, Nos. 32 and 34..... 50¢10¢
 Rolled Blind Hinges, Nos. 232 and 234..... 55¢10¢
 Rolled Plate..... 70¢10¢
 Rolled Raised..... 70¢10¢
 Plate Hinges ½, 10 & 13 in., \$ 5¢
 "Providence" over 12 in., \$ 4¢

Hoes—

D. & H. Scovill..... 20¢
 Lane's Crescent Planters Pattern..... 45¢2¢
 Lane's Razor Blade, Scovill Pattern..... 45¢2¢
 Maynard, S. & O. Pat..... 45¢2¢
 Sandusky Tool Co., S. & O. Pat. 60¢5¢
 Hubbard & Co., S. & O. Pat. 80¢5¢60¢10¢
 Chattanooga Tool Co., S. & O. Pat. 60¢
 5¢60¢10¢
 Grub..... 60¢60¢10¢

Handled—

Garden, Mortar, &c..... 70¢
 Planter's, Cotton, &c..... 70¢
 Warren Hoe..... 80¢
 Magic..... \$ doz \$4.00

Hog Rings and Ringers—See

Rings and Ringers.

Holding Apparatus—See

Machines, Holding.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.
 Sprengle's Pat..... \$ doz \$18..... 80¢
 Bit.
 Extension.
 Barber's, \$ doz \$15.00..... 40¢40¢10¢
 Ives, \$ doz \$30.00..... 60¢5¢60¢10¢
 Diagonal..... \$ doz \$24.00, 40¢
 Angular..... \$ doz \$24.00, 40¢5¢
 File and Tool—
 Bait Pat..... \$ doz \$4.00; 25¢
 Nicholson File Holders..... 20¢

Hooks—

Cast Iron—
 Bird Cage, Sargent's list..... } 60¢10¢10¢
 Bird Cage, Reading..... } 60¢10¢10¢
 Clothes Line, Sargent's list..... } 60¢10¢10¢
 Clothes Line, Reading list..... } 60¢10¢10¢
 Ceiling, Sargent's list..... 55¢10¢10¢
 Harnes, Reading list..... 55¢10¢55¢10¢10¢
 Coat and Hat, Sargent's list..... 55¢10¢60¢10¢
 Coat and Hat, Reading..... 50¢10¢50¢10¢10¢

Wrought Iron—

Cotton..... \$ doz \$1.25
 Cotton Pat. (N. Y. Mallet & Handle W'ks.)..... 50¢
 1886..... 55¢10¢55¢10¢10¢
 Wrought Staples, Hooks, &c..... 50¢
 See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April,
 1886..... 50¢
 Wire Coat and Hat, Miles, list April,
 1886..... 50¢
 Indestructible Coat and Hat..... 45¢
 Wire Coat and Hat, Standard..... 45¢
 Handy Hat and Coat..... 50¢10¢
 Steady Ceiling Hooks..... 50¢10¢
 Belt..... 80¢50¢10¢
 Atlas, Coat and Hat..... 60¢

Miscellaneous.

Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50
 Noll's Grass..... \$ doz \$2.25
 Bush..... 55¢60¢
 Whiffetree Patent..... 55¢
 Hooks and Eyes—Malleable Iron..... 70¢70¢10¢
 Hooks and Eyes—Brass..... 60¢10¢10¢
 Fish Hooks, American..... 50¢
 Bench Hooks..... See Bench Stops.

Horse Nails—See

Nails, Horse.

Horse Shoes—See

Shoes, Horse.

Hose, Rubber—

Competition..... 75¢75¢10¢
 Standard..... 60¢10¢10¢70¢
 Extra..... 50¢10¢60¢
 N. Y. B. & P. Co., Para..... 30¢
 N. Y. B. & P. Co., Extra..... 40¢40¢10¢
 N. Y. B. & P. Co., Dundee..... 60¢5¢

Huskers—

Blair's Adjustable..... \$ gr \$8.00
 Blair's Adjustable Clipper..... \$ gr 7.00
 Hubbard's Solid Steel..... \$ gr 4.50

Indurated Fiber-Ware—See

Ware, Indurated Fiber.—

Irons.

From 1 to 10, at factory..... \$ 100 D,
 \$2.30@2.40
 Self-Heating..... \$ doz \$9.00 net
 Self-Heating, Tailors'..... \$ doz \$18.00 net
 Mrs. Pott's Irons..... 40¢40¢10¢
 Enterprise Star Irons..... 40¢40¢10¢
 Cold Handle Sad Irons..... 40¢10¢50¢

Ideal Irons new list 50¢10¢50¢ & 10¢10¢
 Salamander, Irons..... 25¢
 B. B. Sad Irons, \$ doz..... 30¢30¢
 Combined Fluter and Sad Iron, \$ doz..... 15¢
 Fox Reversible, Self-Fluter \$ doz \$24.00
 Chinese Laundry (N. E. Butt Co.) 8½¢, 15¢
 New England..... 3¢, 15¢
 Mahony's Troy Pol. Irons..... 25¢
 Sensible..... 20¢20¢5¢
 National Self-Heating..... 30¢

Soldering—
 Soldering Coppers..... \$ D 22¢@23¢
 Cover's Adjustable, list Jan. 1, 1886..... 35¢25¢

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy..... 25¢

Kettles— Spun, Stamped.
 Brass, 7 to 17 in., \$ D..... 24¢ 21¢
 Brass larger than 17 in., 26¢ 23¢4¢
 Enamelled and Tea—See Hollow-Ware.

Keys—

Lock Ass'n list Dec. 30, 1886..... 50¢10¢
 Eagle, Cabinet, &c..... 35¢25¢
 Hotchkiss' Brass Blanks..... 40¢
 Hotchkiss' Copper and Tinned..... 40¢
 Hotchkiss' Pad and Cab..... 35¢
 Hotchkiss' Bed Keys..... \$ doz \$4.00, 15¢
 Wollensak Tinned..... 50¢10¢

Knife Sharpeners—See Sharpen-

ers, Knife.

Knives.

Butcher, Shoe, &c—
 Wilson's Butcher Knives..... 25¢30¢
 Ames' Butcher Knives..... 25¢
 Foster Bros' Butcher, &c..... 40¢
 Nichol's Butcher Knives..... 40¢10¢
 Ames' Shoe Knives..... 20¢25¢
 Ames' Bread Knives, \$ doz \$1.50, 15¢20¢
 Moran's Shoe and Bread..... 20¢
 Hay and Straw..... See Hay Knives.
 Table and Pocket..... See Cutlery.
 Corn, Auburn Mfg. Co. Western Pat..... \$2.00
 Corn, Auburn Mfg. Co. Crescent..... \$3.50

Corn—

Bradley's..... 10¢
 Wadsworth's..... 25¢

Drawing—

Witherby.....
 P. S. & W..... } 75¢ 75¢10¢
 New Haven.....
 Merrill..... 60¢10¢60¢10¢5¢
 Douglas..... 75¢75¢5¢
 Watrous..... 15¢10¢25¢
 L. & J. White..... 20¢5¢
 Bradley's..... 35¢
 Adjustable Hays..... 25¢25¢5¢
 Wilkinson's Folding..... 25¢25¢5¢

Hay and Straw—

Lightning, Mfrs' price \$ doz \$18.00, 25¢
 But Knives cut this price freely,
 often selling at \$8 @ \$8.50..... 40¢10¢
 Wadsworth's..... 40¢7¢40¢10¢
 Carter's Needle..... \$ doz \$11.00@11.50
 Heath's..... \$ doz \$13.00@13.50
 Auburn Hay, Com. and Spear Point..... 50¢
 Auburn Straw..... 40¢
 Noll's Hay..... \$ doz \$8.00 @ \$9.00

Mining.

Am. quality, \$ gr. 1 blade, \$7;
 2 blades, \$12; 3 blades, \$18..... net
 Lothrop's..... 20¢10¢
 Smith's, \$ doz, Single, \$2.00; Double, \$3
 40¢40¢
 Knapp & Cowles..... 50¢10¢30¢
 Adjustable..... \$ doz \$3.00 25¢
 Buffalo Double Adj'table, \$ doz \$3.00 25¢

Knobs—

Door Mineral..... 60¢65¢
 Door Por. Plated..... 70¢75¢
 Door Por. Plated, Nickel..... \$2.00@2.25
 Drawer, Porcelain..... 60¢10¢60¢10¢10¢
 Hematite Door Knobs..... 40¢10¢50¢
 Yale & Towne Wood, list Dec. 1886..... 40¢
 Furniture Plain..... 75¢ gro inch, 10¢
 Furniture, Wood Screws..... 25¢10¢
 Base, Rubber Tip..... 70¢10¢5¢
 Picture, Judd's..... 60¢10¢10¢70¢
 Picture, Sargent's..... 70¢10¢
 Picture, Hematite..... 35¢5¢
 Shutter, Porcelain..... 65¢10¢
 Carriage, Jap..... \$ gro 80¢, 60¢10¢
 Bardsley's Wood Door, Shutter, &c. 40¢

Ladies.

Melting, Sargent's..... 55¢10¢
 Melting, Reading..... 35¢10¢
 Melting, Monroe's Pat..... \$ doz \$4.00, 40¢
 Melting, P. S. & W..... 35¢10¢40¢
 Melting, Warner's..... 30¢

Lanterns.

Tubular—
 Plain with Guards, \$ doz..... \$4.00@4.25
 Lift Wire, with Guards..... \$4.50@4.75
 Square Plain, with Guards..... \$4.00@4.25
 80. Lift Wire, with Guards..... \$4.25@4.50
 Without Guards, 25¢ \$ doz less.

Miscellaneous.

Police, Small, \$6.00; Medium, \$7.25;
 Large, \$9.75..... 20¢25¢

Lawn Mowers—See

Mowers, Lawn.

Leaders, Cattle.

Humason, Beckley & Co.'s..... 70¢
 Sargent's..... 60¢5¢10¢
 Hotchkiss..... 30¢
 Peck, Stow & W. Co..... 60¢10¢

Lemon Squeezers—See

Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
 Class 3 and 4, Bronzed Iron..... 50¢
 Class 3 and 4, Bronze Metal..... 25¢
 Class 3 and 4, Brass..... 35¢
 Skylight Lifters..... 35¢
 Crown, Eagle and Shield..... 50¢
 Reiter's, list Aug. 1, 1889..... 50¢10¢10¢3¢
 Bronzed Iron Rods..... 50¢10¢10¢3¢
 Brass, Real Bronze or Nickel Plate, 30¢

Excelsior..... 50¢10¢25¢
 Shaw's..... 50¢10¢
 Payson's Universal..... 40¢40¢10¢

Lines—

Cotton and Linen Fish, Draper's..... 50¢
 Draper's Chalk..... 50¢
 Draper's Mason's Linen, 84 ft., No. 1,
 \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4,
 \$2.75; No. 5, \$3.25..... 25¢
 Cotton Chalk..... 55¢
 Samson, Cotton, No. 4, \$2; No. 4½, \$2.50;
 No. 5, \$3..... 10¢

Silver Lake, Braided, No. 0, \$6.00; No. 1,
 \$6.50; No. 2, \$7.00; No. 3, \$7.50 \$ gr..... 25¢
 Mason's Linen, No. 3½, \$1.50; No. 4,
 \$2.00; No. 4½, \$2.50..... 45¢
 Mason's Colored Cotton..... 45¢
 Wire Clothes..... Nos. 12, 14, 20
 100 ft..... \$4.00 \$3.50 \$3.00
 Ventilator Cord, Samson Braided,
 White or Drab Cotton, \$ doz \$7.50, 20¢

Locks, &c.—

Cabinet—

Eagle, Gaylord Par- list March, '84, rev
 ker and Corbin..... Jan. 1, '85..... 33¢42¢
 Deits, Nos. 36 to 39..... 40¢10¢
 Deits, Nos. 51 to 53..... 40¢10¢
 Deits, Nos. 56 to 58..... 40¢10¢
 Stoddard Lock Co..... 30¢30¢4¢
 "Champion" Night Latches..... 40¢
 Barnes Mfg. Co..... 40¢40¢10¢
 Eagle and Corbin Trunk..... 25¢25¢
 "Champion" Cab. and Combin..... 33¢4¢
 Yale..... net prices
 Romer's..... 35¢

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 30, 1889..... 60¢10¢60¢
 1889..... 10¢10¢
 Mallory, Wheeler & Co., list
 July, '88..... lower net
 Sargent & Co., list Aug. 1, '88
 Reading Hardware Co., list
 Feb. 2, '88..... often
 made.
 Brittan, Graham & Mathes, list Jan.
 1890..... 60¢10¢10¢
 Perkins' Burglar Proof..... 60¢25¢
 Plate..... 33¢42¢
 Barnes Mfg. Co..... 40¢40¢10¢
 Yale..... net prices
 Deits Flat Key..... 50¢
 L. & C. Round Key Latches..... 33¢42¢
 Romer's Night Latches..... 15¢
 Shephardson or U. S..... 35¢
 Seed's N. Y. Hasp Lock..... 25¢

Padlocks—

List Dec. 33, '84..... 75¢75¢10¢
 Brittan, Graham & Mathes..... 75¢10¢
 Yale Lock Mfg. Co.'s..... net prices
 Eagle..... 25¢25¢
 Eureka, Eagle Lock Co..... 40¢25¢
 Romer's, Nos. 0 to 91..... 30¢
 Romer's Scandinavian, &c., Nos. 100 to
 505..... 50¢, 15¢
 A. E. Deits..... 40¢
 Champion Padlocks..... 40¢
 Hotchkiss..... 40¢
 Star..... 45¢
 Horseshoe..... \$ doz \$9, 40¢40¢10¢
 Barnes Mfg. Co..... 40¢40¢10¢
 Noll's..... 80¢
 Brown's Pat..... 25¢
 Scandinavian..... 40¢
 E. T. Fraim's Keystone Scandinavian:
 Nos. 110, 120, 130 and 140..... 90¢10¢
 Other Nos..... 80¢
 Ames Sword Co. up to No. 150..... 40¢
 Ames Sword Co. above No. 150..... 50¢
 Slaymaker Barry & Co..... 45¢5¢
 No. 41 line..... 60¢5¢
 No. 31 line..... 60¢5¢
 No. 21 line..... 75¢75¢
 Sash, &c.

Clark's, No. 1, \$10; No. 2, \$8 \$ gr..... 30¢4¢

Ferguson's..... 33¢4¢

Morris and Triumph, list Aug. 16, 1886..... 60¢25¢

Victor..... 60¢10¢25¢

Walker's..... 10¢

Attwell Mfg. Co..... 25¢33¢4¢

Reading..... 60¢40¢10¢10¢10¢

Hammond's Window Springs..... 40¢

Common Sense, Jap'd, Cop'd and
 Br'd..... \$ gr \$4.00

Common Sense, Nickel Plated..... \$ gr \$10.00

Universal..... 30¢

Kempshall's Gravity..... 80¢

Kempshall's Model..... 60¢60¢10¢

Corbin's Daisy, list Feb. 15, 1886..... 70¢

Payson's Perfect..... 60¢60¢10¢

Huginin's Sash Balances..... 25¢25¢

Huginin's New Sash Locks..... 25¢25¢2¢

Stoddard "Practical".....

Shepard Hand Fluter, No. 110 # doz \$11.00
 Shepard Hand Fluter, No. 95 # doz \$8.00
 Clark's Hand Fluter, # doz \$15.00
 Combined Fluter and Sad Iron, # doz \$15.00
 Buffalo # doz \$10.00

Hoisting—
 Moore's Hand Hoist, with Lock Brake, # doz \$20.00
 Moore's Differential Pulley Block, # doz \$40.00
 Energy Mfg. Co.'s, # doz \$25.00

Mallets.
 Hickory, # doz \$20.00
 Lignumvite, # doz \$20.00
 B. & L. Block Co., Hickory & L. V. # doz \$30.00
 Mattocks, Regular list, # doz \$60.00

Measures—
 Standard Fiberware, No. 1, peck, # dozen, \$4; 1/4 peck, \$3.50.
Meat Cutters—See Cutters, Meat.

Mills.
Coffee—
 Box and Side, List Jan. 1, 1889, # doz \$60.00
 American, Enterprise Mfg. Co., # doz \$30.00
 The Swift, Lane Bros., # doz \$20.00

Mining Knives—See Knives, Mining.

Malasses Gates—See Gates, Malasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.
 Leading makers, # doz \$60.00
 Other makers, # doz \$60.00
 Pennsylvania, # doz \$60.00
 Continental, # doz \$60.00
 New Model, # doz \$60.00
 New Quaker City, # doz \$60.00
 Great American, # doz \$60.00

Muzzles—
 Safety, # doz \$30.00, 25¢

Nails.
 Cut and Wire. See Trade Report.
 Wire Nails, Papered.
 Association list, July 15, '89, 70¢ to 10¢
 Tack Mfrs. list, # doz \$10.00
 Wire Nails, Standard Penny.
 Card June 1, '89, base, # doz \$2.35 @ \$2.40

Horse—
 Nos. 6 7 8 9 10
 Ausable, # doz \$25.00
 Clinton, Fin., # doz \$25.00
 Essex, # doz \$25.00

Lyra # doz \$25.00
Snowden # doz \$25.00
Putnam # doz \$25.00
Vulcan # doz \$25.00
Northwest # doz \$25.00

Globe # doz \$25.00
Boston # doz \$25.00
A. C. # doz \$25.00
C. B. K. # doz \$25.00
Champlain # doz \$25.00

New Haven # doz \$25.00
Saranac # doz \$25.00
Champion # doz \$25.00
Capewell # doz \$25.00

Star # doz \$25.00
Anchor # doz \$25.00
Western # doz \$25.00
Empire # doz \$25.00

Picture—
 Brass Head, Sargent's list, # doz \$50.00
 Porcelain Head, Sargent's list, # doz \$50.00
 Porcelain Head, Combination list, # doz \$40.00
 Niles' Patent, # doz \$40.00

Nail Pullers.—See Pullers, Nail.
Nail Sets.—See Sets, Nail.
Nut Crackers.—See Crackers, Nut.

Nuts—
 Nuts, off list Dec. 18, 1889: Square, Hex, Hot Pressed, # doz \$5.00
 Cold Pressed, # doz \$5.00
 In lots less than 100 #, # doz \$4.00
 boxes, add 1¢ to list.

Oakum—
 Government, # doz \$7.00
 U. S. Navy, # doz \$6.00
 Navy, # doz \$5.00

Oilers—
 Zinc and Tin, # doz \$5.00
 Brass and Copper, # doz \$5.00
 Malleable, Hammers' Improved, No. 1, # doz \$4.00
 No. 2, # doz \$4.00
 No. 3, # doz \$4.00

Malleable, Hammers, Old Pattern, same list # doz \$4.00
Prior's Pat. or "Paragon" Zinc # doz \$4.00
Prior's Pat. or "Paragon" Brass # doz \$4.00
Olmstead's Tin and Zinc # doz \$4.00
Olmstead's Brass and Copper # doz \$4.00
Broughton's Zinc # doz \$4.00
Gem P. D. & Co. # doz \$4.00
Steel, Draper and Williams # doz \$4.00

Openers, Can.
 Messenger's Comet, # doz \$3.00
 American, # doz \$3.00
 Duplex, # doz \$3.00
 Lyman's, # doz \$3.00
 No. 4 French, # doz \$3.00
 No. 5, Iron Handle, # doz \$3.00
 Eureka, # doz \$3.00
 Sardine Scissors, # doz \$3.00
 Star, # doz \$3.00
 Sprague, No. 1, # doz \$3.00

World's Best, # gross, No. 1, \$12.00
No. 2, \$24.00; No. 3, \$36.00
Universal, # doz \$3.00
Domestic, # doz \$2.50
Champion # doz \$2.00

Packing, Steam—
Rubber—
 Standard, # doz \$60.00
 Extra, # doz \$60.00
 N. Y. B. & P. Co., Standard, # doz \$50.00
 N. Y. B. & P. Co., Empire, # doz \$60.00
 N. Y. B. & P. Co., Salamander, # doz \$60.00

Jenkins' Standard, # doz \$80.00
Miscellaneous—
 American Packing, # doz \$10.00
 Russia Packing, # doz \$14.00
 Italian Packing, # doz \$14.00
 Cotton Packing, # doz \$14.00
 Jute, # doz \$14.00

Padlocks—See Locks.
Pails.
Galvanized Iron—
 Quarts, 10 12 14
 Hill's Light Weight, # doz \$2.75
 Hill's Heavy Weight, # doz \$3.00
 Whiting's, # doz \$2.75
 Sidney Shephard & Co., # doz \$2.35
 Iron Clad, # doz \$2.50
 Fire Buckets, # doz \$2.75
 Buckets, see Well Buckets.

Indurated Fibre Ware—25¢
 Star Pails, 13 qt., # doz \$2.00
 Fire, Stable and Milk, 14 qt., # doz \$2.80
Standard Fibre Ware—
 Water Pails, 12 qt., per doz, \$4.00
 Dairy Pails, 14 qt., per doz, \$4.50
 Fire Pails, No. 1, 12 qt., per doz, \$4.50
 Fire Pails, No. 2, 14 qt., per doz, \$5.00
 Sugar Pails, # doz \$6.00
 Horse Pails, # doz \$5.00
 Buggy Pails, # doz \$4.00
 Slop Jars (bal. trap), # doz \$5.00
 Chamber Pails, 14-qt., # doz \$6.00

Pans.
Dripping.
 Small sizes, # doz \$5.00
 Large sizes, # doz \$5.00
Fry—
 Standard List:
 No. 0, # doz \$1.00
 No. 1, # doz \$1.25
 No. 2, # doz \$1.50
 No. 3, # doz \$1.75
 No. 4, # doz \$2.00
 No. 5, # doz \$2.25
 No. 6, # doz \$2.50
 No. 7, # doz \$2.75
 No. 8, # doz \$3.00
 No. 9, # doz \$3.25
 No. 10, # doz \$3.50
 No. 11, # doz \$3.75
 No. 12, # doz \$4.00
 No. 13, # doz \$4.25
 No. 14, # doz \$4.50
 No. 15, # doz \$4.75
 No. 16, # doz \$5.00
 No. 17, # doz \$5.25
 No. 18, # doz \$5.50
 No. 19, # doz \$5.75
 No. 20, # doz \$6.00
 No. 21, # doz \$6.25
 No. 22, # doz \$6.50
 No. 23, # doz \$6.75
 No. 24, # doz \$7.00
 No. 25, # doz \$7.25
 No. 26, # doz \$7.50
 No. 27, # doz \$7.75
 No. 28, # doz \$8.00
 No. 29, # doz \$8.25
 No. 30, # doz \$8.50
 No. 31, # doz \$8.75
 No. 32, # doz \$9.00
 No. 33, # doz \$9.25
 No. 34, # doz \$9.50
 No. 35, # doz \$9.75
 No. 36, # doz \$10.00
 No. 37, # doz \$10.25
 No. 38, # doz \$10.50
 No. 39, # doz \$10.75
 No. 40, # doz \$11.00
 No. 41, # doz \$11.25
 No. 42, # doz \$11.50
 No. 43, # doz \$11.75
 No. 44, # doz \$12.00
 No. 45, # doz \$12.25
 No. 46, # doz \$12.50
 No. 47, # doz \$12.75
 No. 48, # doz \$13.00
 No. 49, # doz \$13.25
 No. 50, # doz \$13.50
 No. 51, # doz \$13.75
 No. 52, # doz \$14.00
 No. 53, # doz \$14.25
 No. 54, # doz \$14.50
 No. 55, # doz \$14.75
 No. 56, # doz \$15.00
 No. 57, # doz \$15.25
 No. 58, # doz \$15.50
 No. 59, # doz \$15.75
 No. 60, # doz \$16.00
 No. 61, # doz \$16.25
 No. 62, # doz \$16.50
 No. 63, # doz \$16.75
 No. 64, # doz \$17.00
 No. 65, # doz \$17.25
 No. 66, # doz \$17.50
 No. 67, # doz \$17.75
 No. 68, # doz \$18.00
 No. 69, # doz \$18.25
 No. 70, # doz \$18.50
 No. 71, # doz \$18.75
 No. 72, # doz \$19.00
 No. 73, # doz \$19.25
 No. 74, # doz \$19.50
 No. 75, # doz \$19.75
 No. 76, # doz \$20.00
 No. 77, # doz \$20.25
 No. 78, # doz \$20.50
 No. 79, # doz \$20.75
 No. 80, # doz \$21.00
 No. 81, # doz \$21.25
 No. 82, # doz \$21.50
 No. 83, # doz \$21.75
 No. 84, # doz \$22.00
 No. 85, # doz \$22.25
 No. 86, # doz \$22.50
 No. 87, # doz \$22.75
 No. 88, # doz \$23.00
 No. 89, # doz \$23.25
 No. 90, # doz \$23.50
 No. 91, # doz \$23.75
 No. 92, # doz \$24.00
 No. 93, # doz \$24.25
 No. 94, # doz \$24.50
 No. 95, # doz \$24.75
 No. 96, # doz \$25.00
 No. 97, # doz \$25.25
 No. 98, # doz \$25.50
 No. 99, # doz \$25.75
 No. 100, # doz \$26.00

Paper and Cloth—
Sand and Emery—
 List April 19, 1889, # doz \$50.00
 Sibley's Emery and Crocus Cloth, # doz \$30.00

Parers.
Apple.
 Advance, # doz \$4.75
 Antrim Combination, # doz \$5.25
 Baldwin, # doz \$5.25
 Champion, # doz \$7.25
 Daisy, # doz \$4.00
 Eureka, 1888, # doz \$17.00
 Family Bay State, # doz \$12.00
 Favorite, # doz \$5.00
 Gen., # doz \$5.25
 Gold Medal, # doz \$4.00
 Ideal, # doz \$4.00
 Improved Bay State, # doz \$30.00
 Little Star, # doz \$5.00
 Monarch, # doz \$13.50
 New Lightning, # doz \$5.00
 Oriole, # doz \$5.00
 Penn., # doz \$4.00
 Perfection, # doz \$4.00
 Pomona, # doz \$4.00
 Rocking Table, # doz \$6.00
 Turntable, # doz \$4.50
 Victor, # doz \$13.50
 Waverly, # doz \$4.00
 White Mountain, # doz \$4.50
 72, # doz \$4.25
 78, # doz \$4.75
 78, # doz \$4.50

White Mountain, # doz \$5.00
Antrim Combination, # doz \$5.00
Hoosier, # doz \$13.50

Pencils—
 Faber's Carpenters', # high list 50¢
 Faber's Round Gilt, # doz \$5.25
 Dixon's Lead, # doz \$4.50
 Dixon's Lumber, # doz \$6.75
 Dixon's Carpenters', # doz \$40.00

Picks—
 Railroad or Adze Eye, 5 to 6, # doz \$12.00
 6 to 7, # doz \$13.00
 6 to 7, # doz \$13.00

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.
Box—
 Humason, Beckley & Co.'s, # doz \$60.00
 Sargent & Co.'s, # doz \$17.00
 Peck, Stow & W. Co., # doz \$60.00
Curtain—
 Silvered Glass, # doz \$1.00
 White Enamel, # doz \$1.00
Escutcheon,
 Iron, list Nov. 11, 1889, # doz \$60.00
 Brass, # doz \$60.00

Pipe, Wrought Iron—
 List September 18, 1889,
 1 1/2 and under, Plain, # doz \$7.00
 1 1/2 and under, Galvanized, # doz \$7.00
 1 1/2 and over, Plain, # doz \$7.00
 1 1/2 and over, Galvanized, # doz \$7.00
 Boiler Tubes, Iron,
 1 1/2 and under, # doz \$4.50
 2 to 4 inch, # doz \$5.00
 4 inch and larger, # doz \$5.25

Planes and Plane Irons—
Wood Planes—
 Molding, # doz \$45.00
 Joint, First Quality, # doz \$55.00
 Bench, Second Quality, # doz \$65.00
 Bailey's (Stanley R. & L. Co.), # doz \$40.00

Iron Planes—
 Bailey's (Stanley R. & L. Co.), # doz \$40.00
 Miscellaneous Planes (Stanley R. & L. Co.), # doz \$40.00
 Victor Planes (Stanley R. & L. Co.), # doz \$40.00

Steel's Iron Planes.
 Verclen Mal Iron Co., # doz \$40.00
 Davis's Iron Planes, # doz \$40.00
 Birmingham Plane Co., # doz \$40.00
 Gage Tool Co.'s Self-Setting, # doz \$40.00
 Chaplin's Iron Planes, # doz \$40.00
 Sargent's, # doz \$40.00
 Standard Tool Co., # doz \$40.00

Plane Irons—
 Butcher's, # doz \$5.00
 Buck Bros, # doz \$5.00
 Auburn "Thistle", # doz \$5.00
 Ohio, # doz \$5.00
 Sandusky, # doz \$5.00
 S. & I. J. White, # doz \$5.00

Plates.
 Felloe, # doz \$6.00

Pliers and Nippers—
 Button's Patent, # doz \$30.00
 Hall's No. 2, 5 in., # doz \$13.50
 Humason & Beckley Mfg. Co., # doz \$50.00
 Gas Pliers, # doz \$60.00
 Gas Pliers, Custer's Nickel Plated, # doz \$60.00
 Eureka's Pliers and Nippers, # doz \$40.00
 Russell's Parallel, # doz \$25.00
 P. S. & W. Cast Steel, # doz \$50.00
 P. S. & W. Tinner's Cutting Nippers, # doz \$50.00

Carew's Pat. Wire Cutters. # doz \$20.00
Morrill's Parallel, # doz \$12.00
Cronk's 8 in., # doz \$15.00
10 in., # doz \$21.00
40¢ to 40¢ 5/8

Plumbs and Levels—
 Regular List, # doz \$70.00
 Diston's, # doz \$45.00
 Pocket Levels, # doz \$70.00
 Davis Iron Levels, # doz \$30.00
 Davis' Inclinoimeters, # doz \$10.00

Pouchers.
Egg.
 Buffalo Steam Egg Pouchers, # doz, No. 1, # doz \$6.00
 No. 2, # doz \$6.00
Police Goods.
 R. I. Tool Co., Handcuffs, # doz \$15.00
 R. I. Tool Co., Leg Irons, # doz \$25.00
 Dole's Improved Handcuffs, 2 Hands, # doz \$25.00
 Polished, # doz \$48.00
 Nickel, # doz \$57.00
 3 Hands, Polished, # doz \$72.00
 Nickel, # doz \$84.00
 J. P. Lovell's Police Goods, # doz \$25.00

Polish, Metal.
 Prestoline, # doz \$20.00
 Prestoline Paste, # doz \$30.00
 Gaston's Silver Compound, # doz \$30.00

Pokes, Animal—
 Bishop's I. X. L., # doz \$6.00
 Bishop's O. K., # doz \$5.25
 Bishop's Pioneer, # doz \$3.75
 Bishop's American, # doz \$2.75

Polish, Stove.
 Joseph Dixon's, # doz \$6.00
 Gem, # doz \$4.50
 Gold Medal, # doz \$6.00
 Mirror, # doz \$6.00
 Lustr, # doz \$4.75
 Ruby, # doz \$5.75
 Rising Sun, 5 gro 10 in., # doz \$5.50
 Dixon's Plumbago, # doz \$8.00
 Boynton's Noon Day, # doz \$13.00
 Parlor Pride Stove Enamel, # doz \$3.00
 Yates' Liquid, 2 3 5 10 gal., # doz \$8.00
 Yates Standard Paste Polish, 10-b cans, # doz \$15.00

Jet Black. # doz \$3.50
Japanese. # doz \$3.50
Firestone. # doz \$3.50
Diamond O. K. Enamel. # doz \$19.00
Bonell's Liquid Stove Polish. # doz \$9.00
Bonell's Paste Stove Polish. # doz \$9.00
Black Eagle Benzine Paste, 5 and 10 b cans. # doz \$12.00
Black Jack Water Paste, 5 and 10 b cans. # doz \$12.00
Nickel Plate Paste. # doz \$6.00

Poppers, Corn—
 Round or Square, 1 qt., # gr \$10.00
 Round or Square, 1 1/2 qt., # gr \$15.00
 Round or Square, 2 qt., # gr \$18.50

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
 Tinned, # doz \$40.00
 Enamel, # doz \$40.00
 Family, Howe's "Eureka", # doz \$40.00
 Family, L. F. C.'s "Handy", # doz \$50.00

Presses.
Fruit and Jelly—
 Enterprise Mfg. Co., # doz \$20.00
 Henis, # doz \$2.50
 Shepard's Queen City, # doz \$40.00

Pruning Hooks and Shears—
 See Shears.

Pullers.
 Curtis Hammer, # doz \$9.00
 Giant, No. 1, # doz \$13.00
 Giant, No. 2, # doz \$15.00
 Pelican, # doz \$9.00

Pulleys—
 Hot House, Awning, &c., # doz \$60.00
 Japanned Screw, # doz \$60.00
 Brass Screw, # doz \$60.00
 Japanned Slide, # doz \$60.00
 Japanned Clothes Line, # doz \$60.00
 Empire Sash Pulley, # doz \$55.00
 Moore's Sash, Anti-Friction, # doz \$50.00
 Hay Fork, Solid Eye, # doz \$4.00
 Hay Fork, "Anti-Friction", 5 in. Solid, # doz \$4.50
 Hay Fork, "F" Common and Pat., # doz \$4.00
 Bushed, # doz \$20.00
 Hay Fork, Tarbox Pat. Iron, # doz \$30.00
 Hay Fork, Reed's Self-Lubricating, # doz \$45.00
 Shade Rack, # doz \$45.00
 Thackle Blocks, # doz \$45.00
 Moore's Anti-Friction 5 in. Wheel, # doz \$12.00

Pumps—
 Clister, Best Makers, # doz \$60.00
 Pitcher Spout, Best Makers, # doz \$70.00
 Pitcher Spout, Cheaper Goods, # doz \$70.00

Punches—
 Saddlers' or Drive, good, # doz \$60.00
 Bemis & Call Co.'s Cast Steel Drive, # doz \$50.00
 Bemis & Call Co.'s Springfield Socket, # doz \$50.00
 Spring, good quality, # doz \$25.00
 Spring, Leach's Pat., # doz \$15.00
 Bemis & Call Co.'s Spring and Check, # doz \$40.00
 Solid Tinner's P.S. & W. Co., # doz \$14.44
 Tin's Hollow Punches P.S. & W. Co., # doz \$20.00
 Rice Hand Punches, # doz \$15.00
 Avery's Revolving, # doz \$40.00
 Avery's Saw-Set and Punch, See Saw Sets.

Rail—
 Sliding Door, Wrt Brass, # doz \$35.00
 Sliding Door, Bronzed Wrt Iron, # doz \$40.00
 Sliding Door, Iron, Painted, # doz \$40.00
 Barn Door, Wrt Iron, # doz \$40.00
 Per 100 feet, # doz \$2.00
 B. D. for N. E. Hangers, # doz \$2.50

Rakes—
 Cast Steel, Association goods, # doz \$70.00
 Cast Steel, outside goods, # doz \$70.00

Malleable. # doz \$60.00
Gibbs Lawn Rake. # doz \$70.00
Canton Lawn Rake. # doz \$50.00
Pt. Madison Frize Bow Brace and Peel. # doz \$60.00
Fort Madison Steel Tooth Lawn Rake. # doz \$60.00

Razor.
 J. R. Torrey Razor Co., # doz \$20.00
 Wostenholme and Butcher, # doz \$10.00
 Jordan's AAA1, list Nov. 1, 1889, # doz \$50.00
 Jordan's Old Faithful, list Nov. 1, 1889, # doz \$50.00
 Electric, # doz \$50.00

Razor Straps—See Straps, Razor.

Rings and Ringers.
Bull Rings—
 Union Nut Co., # doz \$55.00
 Sargent's, # doz \$60.00
 Hotchkiss' low list, # doz \$30.00
 Humason, Beckley & Co.'s, # doz \$70.00
 Peck, Stow & W. Co.'s, # doz \$50.00
 Kilrich Hdw. Co., White Metal, low list, # doz \$50.00

Hog—
 Top of the Hill Ringers, # doz \$20.00
 Top of the Hill Ringers, # doz \$13.25
 Hill's Improved Ringers, # doz \$4.25
 Hill's Old Style Ringers, # doz \$4.75
 Hill's Tongue, # doz \$4.50
 Hill's Rings, # doz \$2.15
 Perfect Rings, # doz \$1.50
 Perfect Rings, # doz \$2.15
 Blair's Hog Ringers, # doz \$2.25
 Blair's Hog Ringers, # doz \$2.25
 Champion Ringers, # doz \$2.00
 Champion Ringers, Double, # doz \$2.25
 Brown's Ringers, # doz \$2.00
 Brown's Ringers, # doz \$1.50

Rivets and Barbs—
 Iron, list Nov. 17, '87, # doz \$40.00
 Copper, # doz \$50.00
 Coppered Iron, Best Brand, # doz \$40.00

Rivet Sets—See Sets.

Rods—
 Stair, Brass, # doz \$25.00
 Stair, Black Walnut, # doz \$40.00

Rollers—
 Barn Door, Sargent's list, # doz \$60.00
 Acme Moore's Anti-Friction, # doz \$55.00
 Union Barn Door Roller, # doz \$70.00

Rope—
 Manufacturers' prices:
 Manila, 1/4 in. and larger, # doz \$15.00
 Manila, 1/2 in. and larger, # doz \$15.00
 Manila, 3/4 in. and larger, # doz \$15.00
 Manila, 1 in. and larger, # doz \$15.00
 Manila, 1 1/4 in. and larger, # doz \$15.00
 Manila, 1 1/2 in. and larger, # doz \$15.00
 Manila, 1 3/4 in. and larger, # doz \$15.00
 Manila, 2 in. and larger, # doz \$15.00
 Manila, 2 1/4 in. and larger, # doz \$15.00
 Manila, 2 1/2 in. and larger, # doz \$15.00
 Manila, 2 3/4 in. and larger, # doz \$15.00
 Manila, 3 in. and larger, # doz \$15.00
 Manila, 3 1/4 in. and larger, # doz \$15.00
 Manila, 3 1/2 in. and larger, # doz \$15.00
 Manila, 3 3/4 in. and larger, # doz \$15.00
 Manila, 4 in. and larger, # doz \$15.00
 Manila, 4 1/4 in. and larger, # doz \$15.00
 Manila, 4 1/2 in. and larger, # doz \$15.00
 Manila, 4 3/4 in. and larger, # doz \$15.00
 Manila, 5 in. and larger, # doz \$15.00
 Manila, 5 1/4 in. and larger, # doz \$15.00
 Manila, 5 1/2 in. and larger, # doz \$15.00
 Manila, 5 3/4 in. and larger, # doz \$15.00
 Manila, 6 in. and larger,

Atkins' Circular Shingle and Heading

Atkins' Silver Steel Diamond X Cuts

Atkins' Special Steel Dexter X Cuts

Atkins' Special Steel Diamond X Cuts

Atkins' Champion and Electric Tooth

Atkins' Hollow Back X Cuts

Atkins' Mulay, Mill and Drag

Atkins' One-Man Saw, with handles

W. M. & C. Hand

W. M. & C. Champion X Cuts, Regu-

lar

W. M. & C. X Cuts, Thin Back

Peace Circular and Mill

Peace Hand Panel and Rip

Peace Cross Cuts, Standard

Peace Cross Cuts, Thin Back

Richardson's Circular and Mill

Richardson's X Cuts

No. 1, 39¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—

Griffin's, complete

Griffin's Hack Saw, Blades

Star Hack Saws and Blades

Eureka and Crescent

Scroll—

Lester, complete, \$10.00

Rogers, complete, \$4.00

Barnes' Builders' and Cabinet Makers

Barnes' Scroll Saw Blades

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Sets.

Axe and Tool.

Aiken's Sets, Axes and Tools

No. 20, \$10.00

Pray's Adj. Tool Hds., No. 1, \$12.25

No. 2, \$12.40

Miller's Falls Adj. Tool Hds.

No. 1, \$12.25

Henry's Combination Haft

No. 45, \$10.50; No. 48, \$12.50

Stanley's Excelsior

No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50

Nail—

Square

Bound

Buck Bros.

Cannon's Diamond Point

Rivet.

Regular list

Saw—

Stillman's Genuine

Stillman's Imita

Common Lever

Morrill's No. 1, \$15.00; No. 2, \$14.00

Leach's No. 0, \$8.00; No. 1, \$15.00

Nash's

Hammer, Hotchkiss

Hammer, Bents & Call Co.'s new Pat.

Bemis & Call Co.'s Lever and Spring

Bemis & Call Co.'s Plate

Bemis & Call Co.'s Cross Cut

Aiken's Genuine

Aiken's Imitation

Hart's Pat. Lever

Dillon's Star

Atkin's Lever

Atkin's Criterion

Croissant (Keller), No. 1, \$15.00; No. 2, \$14.00

Avery's Saw Set and Punch

Chieftain H. R. Co.'s Superior

Scales—

Hatch, Counter, No. 171, good quality

Hatch, Tea, No. 161

Union Platform, Plain

Union Platform, Striped

Chatillon's Grocers' Trip Scales

Chatillon's Eureka

Chatillon's Favorite

Family Turnbills

Riehl Bros.' Platform

Scale Beams—See Beams, Scale.

Scissors, Fluting

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.)

Box, 1 Handle

Box, 2 Handle

Defiance Box and Ship

Foot, Common

Ship, R. I. Tool Co.

Screen Window and Door

Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron

Bench, Wood, Bench

Bench, Wood, Hickory

Hand, Wood

Lag, Blunt Point, list Jan. 1, 1890, 75¢

Coach and Lag, Gimlet Point, list Jan. 1, 1890, 75¢

Bed

Hand Rail, Sargent's

Hand Rail, H. & B. Mfg. Co.

Hand Rail, Am. Screw Co.

Jack Screws, Millers Falls list

Jack Screws, P. S. & W.

Jack Screws, Sargent

Jack Screws, Stearns

Cork—

Humason & Beckley Mfg. Co.

Williamson's

Hows Bros. & Hulbert

Machine—

Flat Head, Iron

Round Head, Iron

Wood—

List March 1, 1890.

Flat Head Iron

Round Head Iron

Flat Head Brass

Round Head Brass

Flat Head Bronze

Round Head Bronze

Rogers' Drive Screws

Scroll Saws—See Saws, Scroll.

Scythe Snaths—See Snaths, Scythe.

Sharpeners, Knife.

Parkin's.

Applewood Handles

Rosewood or Cocobolo

Shaves, Spoke.

Iron

Wood

Bailey's (Stanley R. & L. Co.)

Stearns

Cincinnati

Shears—

American (Cast) Iron

Barnard's Lamp Trimmers

Timmers

Seymour's, List, Dec. 1881

Heinisch's, List, Dec. 1881

Heinisch's Tailor's Shears

First quality C. S. Trimmers

Second quality C. S. Trimmers

Acme Cast Shears

Diamond Cast Shears

Clipper

Victor Cast Shears

Hows Bros. & Hulbert, Solid Forged

Steel

Chicago Drop Forge & F. Co., Solid

Steel Forged

Clausen Shear Co., Japaned

Clausen Shear Co., Nickel, same list

Electric

Pruning Shears and Hooks.

Dillon's Combined Pruning Hook and

Saw

Dillon's Pruning Hook

E. S. Lee & Co.'s Pruning Tools

Pruning Shears, Henry's Pat.

Henry's Pruning Shears

Wheeler, M. & C. Co.'s Combination

Dunlap's Saw and Chisel

J. Mallinson & Co., No. 1, \$5.25; No. 2, 75¢

P. S. & W. Co.

Tinners', etc.—

Shears and Snips (P. S. & W.)

Snips, J. Mallinson & Co.

Sheaves—

Sliding Door—

M. W. Co., list July, 1888

R. & E., list Dec. 18, 1888

Corbin's list

Patent Roller

Patent Roller, Hatfield's

Russell's Anti-Friction, list Dec. 18, 1888

Moore's Anti-Friction

Sliding Shutter—

R. & E. list Dec. 18, 1888

Sargent's list

Reading list

Ship Tools—

L. & J. White

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phoenix, at factory.

Mule—

Add \$1 per keg to above prices.

Oz. Wrought—

Ton lots

1000 lb. lots

500 lb. lots

Shot—

(Eastern prices 2¢ off, cash, 5 days.

Drop, 7 bag, 25 lb.

Drop, 7 bag, 5 lb.

Buck and Chilled, 7 1/2-lb bag

Buck and Chilled, 5-lb bag

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1888

NOTE.—Jobbers frequently give 5¢ to 7½¢ extra on above.

Griffith's Black Iron

Griffith's Solid S. & E. Goods

Old Colony (Sanford Fork & Tool Co.)

St. Louis Shovel Co.

Hussey, Binns & Co.

Hubbard & Co.

Lehigh Mfg. Co.

Payne Pettibone & Son, list January, 1888

Remington's (Lowman's Pat.)

Rowland's, Black Iron

Rowland's Steel

Shovels and Tongs—

Iron Head

Brass Head

Sieves—

Mann's Tin Rim

Buffalo Metallic, S. S. & Co.

Shaker (Barier's Pat.) Flour Sifters

Electric

A. & W. Sifters

Hunter's

Smith's Adjustable Sifters

Smith's Adjustable Milk Strainer

Smith's Adjustable T. & C. Strainer

Staves, Wooden Rim—

Mesh 18, Nested, 80¢

Mesh 20, Nested, 95¢

Mesh 24, Nested, \$1.15

Skels, Thimble—

Western list

Columbus Wrt. Steel, list Jan. 3, 1890

Coldbrookdale Iron Co.

Utica P. S. T. Skels

Utica Turned and Fitted

Slates—

School, by case

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.)

Fitch's

Koch's

Andrew's

Sargent's Patent Guarded

German, new list

Covert

Covert, New Pat.

Covert, New R. E.

Covert Spring

Snaths, Scythe.

List

Soldering Irons—See Irons, Solder-

Ing.

Spittoons, Cuspidors, &c.

Standard Fibercare—

Cuspidors, 8½-inch, 7 doz., No. 5, 88¢

No. 5X, 89¢

Spittoons, Daisy, 8-inch, No. 1, 84¢; 10 and 11 inch, 86¢

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list

Solid Table and Tea, Cen. Stamp. Co.'s

list

Buffalo S. S. & Co.

Silver-Plated—(4 mos. or 5¢ cash 30 days)

Meriden Brit. Co., Rogers

C. Rogers & Bros.

Rogers & Bros.

Reed & Barton

Wm. Rogers Mfg. Co.

Simpson, Hall, Miller & Co.

Rolmes & Edwards Silver Co.

L. Boardman & Son

Miscellaneous.

Holmes & Edwards Silver Co.

No. 67 Mexican Silver

No. 30 Silver Metal

No. 24 German Silver

No. 50 Nickel Silver

No. 49 Nickel Silver

German Silver, Hall & Elton

German Silver

Britannia's Nickel Silver

Boardman's Britannia Spoon

lots

Springs, Door.

Torrey's Rod, regular size

Gray's, 7 gr.

See Rod 7 gr.

Warner's No. 1, 7 doz.

Gem (Coll), list April 19, 1886

Star (Coll), list April 19, 1886

Philadelphia, 5 in., \$5.00; 8 in., \$7.75

Cowell's, No. 1, 7 doz.

Rubber, complete, 7 doz.

Hercules

Shaw Door Check and Spring

Elliptic, Concord, Platform and Half

Starrett's Micrometer Caliper Squares

Avery's Flush Bevel Squares

Avery's Bevel Protractor

Squeezers—

Fodder—

Blair's

Blair's "Climax"

Lemon—

Porcelain Lined, No. 1

Wood, No. 2

Wood, Common

Dunlap's Improved

Sammels, No. 1, \$5.00; No. 2, \$4.12

Jennings' Star

The Boss

Dean's, No. 1, 7 doz.

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s
list.....50&10%

Tap Borers—See Borers, Tap.

Tapes, Measuring—

American.....334&335&25
Spring.....40
Chesterman's, Regular list.....26&30%

Thermometers—

Tin Case.....50&80&10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel

Standard Wire, Hat.....50&10&5%

Tinners' Shears, &c.—See Shears,
Tinners', &c.

Tinware—

Stamped, Japanned and Plead, list
Jan. 20 1887.....70&10&70&10&5%

Tire Benders, Upsetters, &c.—
See Benders and Upsetters, Tire.

Tools.

Coopers—

Bradley's.....29
Barton's.....20&20&5
L. & J. J. White.....20&25
Albertson Mfg. Co.....25
Beatty's.....30
Sandusky Tool Co.....30&30&5
Shaves, Cincinnati Tool Co.....20%

Lumber—

Ring Peavies, "Blue Line".....\$ doz \$20.00
Ring Peavies, Common.....\$ doz \$18.00
Steel Socket Peavies.....\$ doz \$21.00
Mall. Iron Socket Peavies.....\$ doz \$19.00
Cant Hooks, "Blue Line".....\$ doz \$16.00
Cant Hooks, Common Finish.....\$ doz \$14.00
Cant Hooks, Mall. Socket Clasp, "Blue
Line" Finish.....\$ doz \$16.00
Cant Hooks, Mall. Socket Clasp, Com-
mon Finish.....\$ doz \$14.50
Cant Hooks, Clip Clasp, "Blue Line"
Finish.....\$ doz \$14.00
Cant Hooks, Clip Clasp, Common Fin-
ish.....\$ doz \$12.00
Hand Spikes.....\$ doz 6 ft., \$15.00; 8 ft.,
\$20.00
Pike Poles, Pike & Hook.....\$ doz, 12 ft.,
\$11.50; 14 ft., \$12.50; 16 ft., \$14.50;
18 ft., \$17.50; 20 ft., \$21.50
Pike Poles, Pike only.....\$ doz, 12 ft.,
\$10.00; 14 ft., \$11.00; 16 ft., \$12.00; 18
ft., \$15.00; 20 ft., \$20.00
Pike Poles, not ironed.....\$ doz, 12 ft.,
\$6.00; 14 ft., \$7.00; 16 ft., \$8.00; 18
ft., \$12.00; 20 ft., \$16.00
Setting Poles.....\$ doz, 12 ft., \$14.00; 14
ft., \$15.00; 16 ft., \$17.00
Swamp Hooks.....\$ doz \$18.00

Saw—

Atkins' Perfection.....\$ doz \$12.00
Atkins' Excelsior.....\$ doz \$6.00
Atkins' Giant.....\$ doz \$4.00

Tobacco Cutters—See Cutters, To-
bacco.

Transom Lifters—See Lifters,
Transom.

Traps—

Game—

Newhouse.....40&40&5
Onida Pattern.....70&10
Game, Blake's Patent.....40&10&5

Mouse and Rat—
Mouse Wood Choker.....\$ doz \$1.50, 10%
Mouse, Round Wire.....\$ doz \$1.50, 10%
Mouse, Cage, Wire.....\$ doz \$2.50, 10%
Mouse, Catch 'em alive.....\$ dz \$2.50 15%
Mouse, Bonanza.....\$ gr \$10.00
Mouse Delusion.....\$ gr \$10.00
Rat, Decoy.....\$ gr \$10.00, 10%
Ideal.....\$ gr \$10.00
Cyclone.....\$ gr \$10.00
Hotchkiss Metallic Mouse, 5-hole traps,
\$ doz, 90¢; in full cases, \$ doz.....75¢
Hotchkiss Imp. Rat Killer.....\$ gro \$18.50
Hotchkiss New Rat Killer.....\$ gro \$18.50
Schuyler's Rat Killer.....\$ gro \$18.50

Trowels—

Lothrop's Brick and Plastering.....
20&10&5&35%
Reed's Brick and Plastering.....15%
Dialton's Br'k and Plastering, 25&25&10%
Pease's Plastering.....25%
Clement & Maynard's.....20%
Reese's Brick.....15&20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—

Butter and cheese.....25%

Trimmers, Spoke.

Bonney's.....\$ doz \$10.00, 50%
Stearns.....20&10%
Ives, No. 1, \$15.00; No. 2, \$12.00 \$ doz.....55&10%
Douglas.....\$ doz \$0.20, 20%
Cincinnati.....25%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine.....BC. B.
No. 9, 1/4 and 1/2 B. Balls.....25¢ 34¢
No. 12, 1/4 and 1/2 B. Balls.....25¢ 34¢
No. 18, 1/4 and 1/2 B. Balls.....25¢ 34¢
No. 24, 1/4 and 1/2 B. Balls.....25¢ 34¢
No. 36, 1/4 and 1/2 B. Balls.....25¢ 34¢
No. 204, Matras, 1/4 and 1/2 B. Balls.....54¢
Chalk Line, Cotton, 1/4 B. Balls.....54¢
Mason Line, Linen, 1/2 B. Balls.....54¢
2-Ply Hemp, 1/4 and 1/2 B. Balls (Spring
Twine).....15¢
3-Ply Hemp, 1/4 B. Balls.....15¢
3-Ply Hemp, 1/2 B. Balls.....15¢
Cotton Wrapping, 5 Balls to a.....15¢
2, 3 and 4-Ply Jute, 1/4 B. Balls.....10¢
Wool.....15¢
Paper.....15¢
Cotton Mops, 6, 9, 12 and 15 B. to doz.....15¢

Vases—

Solid Box.....50&10&50&10&5%
Parallels.....
Fisher & Norris Double Screw.....15&10%
Stephens.....25&30%
Parker's.....20&25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Merrill's.....40&10%
Trenton.....40&50&40&10%
Merrill's.....15&20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20&25%
Simpson's Adjustable.....20%
Moore's.....20%

Saw Files—

Bonney's, Nos. 2 & 3, \$15.00.....40&10%
Stearns.....334&10&334&10&10%
Stearns' Silent Saw Vices.....334&30%

Sargent's.....60&10%
Hopkins.....\$ doz \$17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vices.....\$ gr \$42.00
Cowell Hand Vices.....30%
Bauer's Pipe Vices.....10%
Cincinnati.....30&10%

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters
Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.

Cast Iron, Hollow—
Stove Hollow-Ware.....55&50&60&5%
Ground.....65&10&65&10&5%
Ungrind.....65&10&65&10&5%
White Enameled-Ware.....60&10&10%
Mashin Kettles.....40&5%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40&5%
Rustless Hollow-Ware.....50&50&5%
Gray Enameled-Ware—
Stove.....50%
Mashin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Enameled—
Agate and Granite Ware, list Jan. 1,
1880.....334&10%
Ironclad Enameled Ware.....dis 334&10%

Kettles—
Galvanized Tea-Kettles—
Inch.....6 7 8 9
Each.....55¢ 00¢ 65¢ 75¢

Standard Fiber—

Wash-Basins, 10 1/2 in.....\$2.00
Wash-Basins, 12 in.....2.25
Keelers, 1 1/4 in.....4.00
Cuspidors.....8.00
Spittoons, "Daisy," 8 in.....4.00
Pail Measure.....4.00
Half-Peck Measure.....3.50
See also Pails.

Indurated Fiber—25%

Spittoons, No. 2, \$ doz.....\$9.00
Basins, Ringed, \$ doz, No. 1, \$4.30;
No. 2, \$4.20; No. 3.....\$3.00
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4
pieces), \$ nest.....\$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4
pieces), \$ nest.....\$3.70
Butter Bowls 16, 17 and 19-inch (3
pieces), \$ nest.....\$2.25
Liquid Measures, pt., qt., 2 qt. and fun-
nell (4 pieces), \$ set.....\$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5
pieces), \$ set.....\$3.00
See also Fuda.

Silver Plated, Hollow—

4 mo. or 5¢ cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....40&5%
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co.....40&5&5%
William Rogers Mfg. Co.....

Washers—

Size.....1/2 5-16 3/8 1/2 3/4 1
Washers.....6 1/2 3/4 1/2 3/4 3 3 3
In lots less than 200 B. \$ 2, add 1/4¢, 5-3
boxes 1¢ to list.

Wedges—

Iron.....\$ 2 3/4
Steel.....\$ 4

Weights, Sash—

Solid Eyes.....\$ ton \$18&19

Well Buckets, Galvanized—See
Buckets, Well, Galvanized.

Wheels, Well.

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.25

Wire and Wire Goods—
Iron—

Market.
Br. & Ann., Nos. 0 to 18.....See
Cop'd, Nos. 0 to 18.....Trade
Galv., Nos. 0 to 18.....Report
Tin'd, Tinned list Nos. 0 to 18.....

Stone.
Br. & Ann'd, Nos. 16 to 18.....674
Bright and Ann'd, Nos. 19 to 26, 674
Br. & Ann'd, Nos. 27 to 36.....70&10%
Tinned.....674
Tinned Broom Wire.....674
Galvanized Fence.....55%
Annealed Fence, Nos. 8 and 9.....65%
Annealed Grade, Nos. 10 to 14.....65%
Brass, list Jan. 18, 1884.....25%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Mallin's Steel and Tin'd on Spools.....50%
Mallin's Brass and Cop. on Spools.....50%
Cast Steel Wire.....50%
Stub's Steel Wire.....\$6.00 to 2, 30%
Steel Music Wire, Nos. 12 to 30, 55¢
Picture Wire.....New list 50¢
Barb Wire Safety Guards.....\$ 1000, \$9.00, 25¢
Wire Clothes Lines, see Lines.

Bright Wire Goods—

Standard list.....85%

Wire Cloth and Netting.

Painted Screen Cloth, good quality,
\$ 100 sq. ft., \$1.60 @ \$1.75
Galvanized Wire Netting.....70&10&75%

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10&50%
Baxter's Diagonal.....40&10&50%
Coes' Genuine.....50&5%
Coes' "Mechanics".....50&10&50%
Hrard Standard.....50&10%
Lamson & Sessions' Engineers'.....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....75%
Girard Agricultural.....75%
Lamson & Sessions' Agric'l.....75%
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....25%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....\$6.00, 50&10%
The Favorite Pocket.....\$ doz \$4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....25&5%
Always Ready.....50%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&5%
Acme, Nickle.....50&5%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Bronze Wrenches.....15&10%
Cincinnati Monkey Wrenches.....15&10%
Taft's Vice Wrench.....55&10&3%

Wringers, Clothes—

List March 11, 1889, 2¢ cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1888,
80&15&85%

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw, per gal. 62 @ 64
Linseed, City, boiled.....64 @ 66
Linseed, Western, raw.....60 @ 62
Lard, City, Extra Winter.....52 @ 54
Lard, City, Prime.....52 @ 54
Lard, City, Extra No. 1.....47 @ 50
Lard, City, No. 1.....42 @ 45
Lard, Western, prime.....42 @ 45
Cotton-seed, Crude, prime.....33 @ 35
Cotton-seed, Crude, off
grades.....30 @ 32
Cotton-seed, Summer Yel-
low, prime.....37 @ 37 1/2
Cotton-seed, Summer Yel-
low, off grades.....39 @ 36
Sperm, Crude.....65 @ 67
Sperm, Natural Spring.....70 @ 72
Sperm, Bleached Spring.....72 @ 74
Sperm, Natural Winter.....74 @ 77
Sperm, Bleached Winter.....70 @ 72
Whale, Crude.....10 @ 12
Whale, Natural Winter.....47 @ 48
Whale, Bleached Winter.....50 @ 51
Whale, Extra Bleached.....54 @ 55
Sea Elephant, Bleached
Winter.....58 @ 60
Menhaden, Crude, Sound.....@ 25
Menhaden, Crude, Southern.....@ 25
Menhaden, Light Pressed.....20 @ 27
Menhaden, Bleached W'ter.....30 @ 31
Menhaden, Extra Bleached.....35 @ 36
Tallow, City, prime.....@ 45
Tallow, Western, prime.....@ 45
Cocanut Ceylon.....@ 6
Cocanut Ceylon.....@ 6
Cod, Domestic.....31 @ 32
Cod, Foreign.....31 @ 32
Red Elaine.....31 @ 34
Red Saponified.....44 @ 46
Bank.....25 @ 28
Olive, Italian, bbls.....27 @ 28
Strait.....27 @ 28
Neatfoot, prime.....62 1/2 @ 75
Palm, prime, Lagos.....54 @ 6

Mineral Oils.

Black, 29 gravity, 25 @ 30
cold test.....per gal 8 @ 9
Black, 29 gravity, 15 cold
test.....8 1/2 @ 9 1/2
Black, 29 gravity, summer.
Cylinder, light, filtered.....6 @ 7

Cylinder, dark, filtered.....14 @ 20
Cylinder, dark, st'm refined.....10 @ 18
Paraffine, 23 1/2 gravity.....11 @ 12
Paraffine, 25 gravity.....10 @ 11
Paraffine, 28 gravity.....8 1/2 @ 9
Paraffine, red, 21 @ 23 grty 14 @ 14 1/2
Paraffine, red, 23 @ 23 grty 12 @ 13

Paints and Colors.

Barytes, Prime White.....\$ ton \$32.00 @ \$25.00
Barytes, Amer. refined.....30.00 @
Barytes, Amer. No. 1.....15.00 @
Barytes, Amer. No. 2.....15.00 @
Barytes, Amer. off-color.....13.00 @ 15.00
Blue, Celestial.....\$ 5 1/2 @ 7 1/2
Blue, Chinese.....45 @ 50
Blue, Prussian.....20 @ 35
Blue, Ultramarine.....7 @ 25
Brown, Spanish.....3 1/2 @ 1
Brown, Vandyke, Amer.....3 @ 3 1/2
Brown, Vandyke, English.....3 @ 3 1/2
Black, American Drop.....2 @ 10
Black, English Drop.....12 @ 14
Black, Frankfurt, Drop.....5 @ 18
Black, Lamp, common.....12 @ 18
Black, Lamp, medium.....10 @ 25
Black, Lamp, prime.....27 @ 33
Carmine, No. 40, in bulk.....3.00 @
Carmine, No. 40, in boxes
or barrels.....3.20 @
Carmine, No. 40, in ounce
bottles.....4.20 @
Chalk, in bulk.....\$ ton 3.75 @ 3.00
Chalk, bbls.....\$ 100 B. 30 @ 35
China Clay, English.....\$ ton 13.50 @ 18.00
China Clay, Southern.....10.00 @ 11.50
Cobalt Oxide, prep'd.....2.90 @
Cobalt Oxide, black.....lots 1000 B. 2.60 @
Cobalt, Oxide, black.....less 1000 B. 2.65 @
Crocus Martius, Engl. \$ B. 1 1/2 @ 3 1/2
Crocus, American.....1 1/2 @ 3 1/2
Green, Paris, in bulk.....14 @ 14 1/2
Green, Paris, 170 @ 175 B
Kegs.....14 1/2 @ 15
Umber, Paris, small pack.....15 @ 21
Green, Chrome, ordinary.....8 @ 13
Green, Chrome, pure.....22 @ 35
Lead, Eng., B.B. white.....9 @ 10
Lead, Ann. White, dry or in oil:
Kegs, lots less than 1000 B.....@ 7
Kegs, lots 1000 B to 5 tons.....@ 6 1/2

Kegs, lots 5 tons to 12 tons.....@ 6 1/2
Kegs, lots 12 tons and over.....@ 6 1/2
Lead, White, in oil, 25 B. tin
pails, add to keg price.....@ 1 1/2
Lead, White, in oil, 12 1/2 B. tin
pails, add to keg price.....@ 1
Lead, White, in oil, 1 to 5 B. as-
sorted tins, add to keg price.....@ 2 1/2
Lead, Red, bbls. and 1/2 bbls.....@ 6
Lead, Red, kegs.....@ 7
Litharge, kegs.....@ 6 1/2
Litharge, bbls. and 1/2 bbls.....@ 6

TERMS, &c.—Lead and Litharge.—On
lots of 1000 B. or over, 60 days' time or
2 1/2 % discount for cash if paid within 15
days of date of invoice.

Ocher, Rochelle.....1.35 @ 1 1/2
Ocher, French Washed.....1 1/2 @ 2 1/2
Ocher, German Washed.....1 1/2 @ 3
Ocher, American.....3 1/2 @ 1 1/2
Orange Mineral, English.....9 @ 9 1/2
Orange Mineral, French.....9 @ 9 1/2
Orange Mineral, German.....8 1/2 @ 9 1/2
Orange Mineral, American.....8 @ 8 1/2
Paris White, English Cliff-
stone.....90 @ 1.10
Paris White, American.....70 @ 80
Red, Indian, English.....5 1/2 @ 7
Red, Indian, American.....2 @ 6
Red, Tuscan.....9 @ 14
Red, Venetian, American.....9 @ 11
Red, Venetian, American.....\$ 104 B. 90 @ 1.25
Red, Venetian, English.....1.00 @ 1.45

Powd.....5 @ 6 1/2
Sienna, Ital., Burnt Lumpa.....1 1/2 @ 3 1/2
Sienna, Ital., Raw, Powd.....5 @ 6 1/2
Sienna, Ital., Raw Lumpa.....3 @ 3 1/2
Sienna, American, Raw.....1 1/2 @ 1 1/2
Sienna, American, Burnt
and Powdered.....1 1/2 @ 1 1/2
Talc, French.....1 1/2 @ 1 1/2
Talc, American.....1 @ 1 1/2
Terra Alba, Frch. \$ 100 B.....72 1/2 @ 80
Terra Alba, English.....80 @ 85
Terra Alba, American No. 1.....70 @ 75
Terra Alba, American No. 2.....38 @ 40
Umber, Turkey, Bnt. and
Powd.....3 1/2 @ 4
Umber, Turkey, Bnt. Lw.....2 1/2 @ 3
Umber, Turkey, R'w Lmgs.....3 1/2 @ 4
Umber, Turkey, Bnt. Amer.....1 1/2 @ 1 1/2

Umber, Turkey, R'w Amer. 1 1/2 @ 1 1/2
Yellow, Chrome.....10 @ 25
Vermilion, Americ. Lead.....11 1/2 @ 13
Vermilion, Quicksilver, bulk.....70 @ 71
Vermilion, Quicksilver, bags.....71 @ 72
Vermilion, Quicksilver,
smaller pkgs.....75 @ 76
Vermilion, English Import.....82 @ 85
Vermilion, Imitation, Eng. 8 @ 25
Vermilion, Trieste.....75 @ 77
Vermilion, Chinese.....28 @ 30
Whiting, Common, \$ 100 B.....40 @ 45
Whiting, Gliders.....50 @ 55
Zinc, American, dry.....\$ 34 @ 44 1/2
Zinc, French, Red Seal.....@ 7 1/2
Zinc, French, Green Seal.....@ 7 1/2
Zinc, French, V. M. X.....6 @ 6 1/2
Zinc, Antwerp, Red Seal.....@ 7 1/2
Zinc, Antwerp, Green Seal.....@ 7 1/2
Zinc, German, L. Z. O.....@ 6 1/2
Zinc, V. M. in Poppy Oil, G.
Seal, lots of 1 ton and
over.....10 1/2 @ 10 1/2
Zinc, V. M. in Poppy Oil,
Red Seal.....@ 10
Lots of less than 1 ton.....9 1/2 @ 10 1/2

Discounts—French Zinc.—Discounts
to buyers of 10-bbl. lots of one or as-
sorted grades, 1¢; 25 bbls, 2¢; 50 bbls,
4¢. No discount allowed on less
than bbl. lots.

Colors in Oil.

Blue, Chinese.....\$ 35 @ 40
Blue, Prussian.....29 @ 45
Blue, Ultramarine.....12 @ 18
Brown, Vandyke.....7 @ 12
Green, Chrome.....8 @ 13
Green, Paris.....15 @ 18
Sienna, Raw.....7 @ 13
Sienna, Burnt.....7 @ 13
Umber, Raw.....7 @ 10
Umber, Burnt.....7 @ 10

Glue.

Low Grade.....\$ 8 @ 10
Cabinet.....12 @ 14
Medium White.....13 @ 15
Extra White.....17 @ 20
French.....9 @ 20
English.....10 @ 15
Irish.....12 @ 15

CURRENT METAL PRICES.

JUNE 4, 1890.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
1/2 to 2 in. round and square.	2.00 @ 2.10
1 to 6 in. x 1/2 to 1 in.	
Refined Iron:	
1/2 to 2 in. round and square.	2.20 @ 2.30
1 to 4 in. x 1/2 to 1 in.	
1/2 to 6 in. x 1/2 to 1 in.	2.40 @ 2.50
1 to 6 in. x 1/2 and 5-16.	2.50 @ 2.60
Rods—1/2 and 11-16 round and sq.	2.50 @ 2.60
Bands—1 to 6 x 3-16 to No. 12.	2.50 @ 2.60
"Burden Best" Iron, base price.	2.80 @
Burden's "H. B. & S." Iron, base price.	2.80 @
"Clister"	3.00 @
Norway Bars	4.00 @
Norway Shapes	5.00 @

Merchant Steel from Store.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.	
Best Cast Steel, base price in small lots.	2 3/4
Best Cast Steel Machinery, base price in small lots.	5

Sheet Iron from Store.

Common American.		R. G. Cleaned.	
10 to 16	3.00 @ 3.50	3.50 @ 3.75	
17 to 20	3.25 @ 3.50	3.75 @ 3.85	
21 to 24	3.35 @ 3.50	3.75 @ 3.85	
25 and 26	3.45 @ 3.50	3.75 @ 3.85	
27	3.55 @ 3.65	4.00 @ 4.25	
28	3.75 @ 3.85	4.25 @	
B. B.			
Galv'd, 14 to 20	5.00 @ 4.75	4.75 @ 4.85	
Galv'd, 21 to 24	5.375 @ 5.125	5.125 @ 5.25	
Galv'd, 25 to 26	5.75 @ 5.50	5.50 @ 5.65	
Galv'd, 27	6.125 @ 5.875	5.875 @ 6.00	
Galv'd, 28	6.50 @ 6.25	6.25 @ 6.35	
Patent Planchet	10 @ 10	10 @ 10	
Russia	9 1/2 @ 10	10 @ 10	
American Cold Rolled B. B.	5 @ 7	5 @ 7	
Craig Polished Sheet Steel	8 1/2 @	8 1/2 @	

English Steel from Store.

Best Cast	15
Extra Cast	16 1/2
Swaged Cast	16
Best Double Shear	15
Blister, 1st quality	12
German Steel, Best	10
2d quality	9
2d quality	8
Sheet Cast Steel, 1st quality	15
2d quality	14
2d quality	12 1/2
R. Musket's "Special"	45
"Titanic"	20

METALS.

Tin.

Banco, Pigs	22 1/2
Straits, Pigs	22 1/2
English, Pigs	22 1/2
Straits in Bars	24 1/2

Tin Plates.

Charcoal Plates.—Bright.		Per box.
Weyn Grade—IC, 10 x 14.		\$6.25
" " " " " " " "		6.50
" " " " " " " "		6.25
" " " " " " " "		12.75
" " " " " " " "		7.75
" " " " " " " "		8.00
" " " " " " " "		7.75
" " " " " " " "		15.50
" " " " " " " "		5.75
" " " " " " " "		7.25
Calland Grade—IC, 10 x 14.		6.25
" " " " " " " "		6.50
" " " " " " " "		6.15
" " " " " " " "		7.40
" " " " " " " "		7.65
" " " " " " " "		7.40
Allaway Grade—IC, 10 x 14.		5.85
" " " " " " " "		5.50
" " " " " " " "		5.85
" " " " " " " "		10.75
" " " " " " " "		6.50
" " " " " " " "		6.65
" " " " " " " "		6.50
" " " " " " " "		13.25
" " " " " " " "		5.00
" " " " " " " "		6.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20.	\$5.12 1/2
" " " " " " " "	7.25
" " " " " " " "	10.25
IX, 10 x 14, 14 x 20.	6.00
BV Grade.—IC, 10 x 14, 14 x 20.	4.87 1/2

Charcoal Plates.—Tenne.

Dean Grade.—IC, 14 x 20.	\$5.00
" " " " " " " "	10.00
IX, 14 x 20.	5.80
20 x 28.	11.00
Abecarne Grade.—IC, 14 x 20.	4.85
" " " " " " " "	9.87
IX, 14 x 20.	5.80
20 x 28.	11.50

Tin Boiler Plates.

IX, 14 x 28.	112 sheets.	\$13.00 @ \$13.00
IX, 14 x 26.	112 sheets.	13.25 @
IX, 14 x 24.	112 sheets.	14.75 @

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ 1/2. Manufactured (including all articles of which Copper is a component of chief value), 45¢ ad valorem.

Ingot.

Lake	15 1/2
Baltimore Grade	15 1/4

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound.									
			Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.		
30—72			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
30—96			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
36—96			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
48—96			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
48—96			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
60—96			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
60—96			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
84—96			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
84—96			22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2	22 1/2		
Over 84 in. wide			25	27	30	35						

All Bath Tub Sheets.... 16 oz. 14 oz. 12 oz. 10 oz.
Per pound..... \$0.25 0.27 0.29 0.32
Bolt Copper, 1/2 inch diameter and over, per pound..... 32¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

14 ounce to square foot and heavier..... 26¢
12 ounce and up to 14 ounce to square foot..... 27¢
10 ounce and up to 12 ounce..... 29¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢
Tinning sheets on one side, 30 x 60 each..... 30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each..... 12¢
Tinning sheets on one side, other sizes, per square foot..... 2 1/4¢
For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48. By the case... 30¢
12 oz. and lighter..... 32¢
14 x 48 and 30 x 60. By the case... 32¢
14 and 16 oz. and heavier. 44¢. 12 oz..... 37¢

Seamless Brass and Copper Tubes.

O. G.	N. G.	%	%	%	%	%	1	1 1/2
8-14	6-12	37	33	30	29	28	27	26
15	13	38	33	31	30	29	28	27
16	14	39	34	32	31	30	29	28
17	15	40	35	33	30	31	30	29
18	16	42	36	34	32	31	30	29
19	17	43	37	35	33	32	31	30
20	18-19	44	39	37	36	35	34	33
21	20	46	41	39	38	37	36	35
22	21	48	42	40	39	38	37	36
23	22	50	44	42	41	40	39	38
24	23	52	45	43	42	41	40	39
25	24	56	49	43	45	44	43	42